

Attachment 6

Investigation Report - Japanese and English Version (Summary)

*Note: English version report does not contain any photographs and figures.
Please refer to the original investigation report written in Japanese.

Toyota

6/24/02

PE02-039

List of Investigation Report (Attachment 6)

Attachment#	Title
6-1	T100 clutch pedal part dash panel cranking failure
6-2	T100 clutch master cylinder attachment dash panel cracking countermeasures meeting
6-3	Minutes of meeting held to discuss response to cracking of T100 clutch master cylinder attachment dash panel
6-4	T100 clutch pedal bracket attachment torque
6-5	T100 clutch pedal bracket tightening control request
6-6	Minutes of No.2 T100 clutch pedal examination meeting
6-7	T100 clutch pedal bracket cracking countermeasure meeting
6-8	Report of results of survey into failure of vehicle in market use
6-9	Clutch pedal bracket
6-10	Background to the development of the 970D Clutch Pedal Bracket
6-11	Cracking to the T100 clutch pedal bracket attachment dash panel (2)
6-12	Damaged T100 clutch pedal – 1
6-13	T100 pedal bracket countermeasures
6-14	T100 Clutch pedal bracket durability no. 2 / Force on pedal 15kgf
6-15	T100 Pedal bracket cracking
6-16	Results of analysis of T100 clutch bracket
6-17	Analysis of T100 clutch pedal bracket strength (with bolts tightened normally)
6-18	Analysis of T100 clutch pedal bracket strength (with bolts loosened)
6-19	Analysis of T100 clutch pedal bracket strength
6-20	Analysis of T100 clutch pedal bracket strength
6-21	Analysis of T100 clutch pedal bracket strength
6-22	T100 Clutch pedal bracket stress distribution countermeasure part
6-23	T100 Clutch pedal bracket durability (countermeasure part)

[REDACTED]

初期フラット化率計画実現不果

現象：カルバダル取工場付近のショット爆破実験にて、爆破後、EMG検査不果。

原因推定：75,428トンの爆破下限到達。

発生状況：1) カタログ 2件。

2) 4x3.5t 距離 141.1m/10年半

3) 走行距離：40,530km, 3,500km

現象推移：1) 爆破実験：カルバダル付近の爆破実験（爆破量 0.1ha）
(約 70t の爆破量)

2) ① 基準点（測定資料）半次時直角計測（手引-動点）

現地実験：半次時直角計測（手引-動点）
結果未出なし。

原因推定（推測）：

1) カタログ 1件： 距離 30km で 3ヶ月以上（爆破後不適切影響）

（手引）（爆破後直角計測は必ず上部と下部を測定する）

（手引）（爆破後直角計測は必ず上部と下部を測定する）

2) カタログ 1件： 距離 2.5km (3月の爆破点から爆破後 2ヶ月)

（手引）

現象推移：測定実験～'92/10 までの当該地の変遷を記し。

今後の対応：

1) 再現実験の実施：（BMX報告）

2) 地の原因調査：① HRCの爆破状況詳細調査（爆破後 3ヶ月後）

スミセンカルアレスの現地化（爆破後 3ヶ月後）→問題点

② 不適合物の調査（過量の爆破による鉱床化）

3) 解説書：上記 2) ③ までの今後の作業方法見直し、実施、実績との比較。

→ 1997年 距離 2.5km (3月の爆破点から爆破後 3ヶ月後)、ナショナル

(page 1)

T100 clutch pedal part dash panel cracking failure

<>> For use at countermeasures meeting, 21st November.

<>> Master cylinder

<>> Cracking in direction of center of hole

1. Problem: Cracking of clutch-pedal bracket attachment dash panel, causing the bracket to move, so that the start switch does not come on, and the engine cannot be started
2. Location of cracking: Installation holes on the lower part of the clutch master cylinder attachment
3. Current state of occurrence:
 - 1) 3 incidents in Canada
 - 2) 4 x E, STD, SVZ, manufactured in Sept / Oct 1992
 - 3) Mileage: 40,150km, 39,000km
4. Other information:
 - 1) No hole missing from dash or cover sides (see attached reference material 1-4)
(Confirmed with TMC quality assurance 7th Nov).
 - 2) Counteracted through addition of bolt in ⑦ standard hole.
(See attached reference material 5) (to be done by dealerships in interim).
Local opinion is that it may be caused by fault in the lack of bolt for this hole, but there is no bolt for this hole from our trial evaluation.
5. Evaluation results during development
 - 1) Clutch pedal operational durability (Feb. 92): No cracking to either pedal bracket or body after 8 million times used at *30kgf force on pedal
*(this value includes a safety factor for clutch use when fully worn)
(T100 was used with the worst case scenario engine of the time, the 2L-4 (15.6kgf))
 - 2) Pedal bracket strength (Feb. 92): All parts within standard values for stress when tested at 200kgf
6. Changes to design: No changes to design of relevant parts between evaluation of prototype and October 1992.
7. Response:
 - 1) Reconstruction and reevaluation: (ENIX report)

- 2) Consideration of other possible causes:
 - (1) detailed study of existing proposal (submitted to TMC on 2nd November 1994)
 - (2) (Commission) Dash panel power parts check (cracks round the dash, etc)
 - No evidence found.
 - (3) Survey of ways in which failed vehicles have been used (e.g. no brakes on pedal, Power steering, Etc.)
- 3) Report on step 2) above, including (3) Request TMC Operations Services Division to undertake survey of current pedal valves in order to facilitate a recommendation to review calibration procedure in the future.
To be discussed at meeting on 21st November.

10th October 1994

Attachment 6-2

No.

東京都区外

秋

東京都区外

東京都区外

1 1
2 1
3 1

1 1

2 1

3 1

4 1

5 1

東京都区外

中

1. T100 フラットヘッド
2. フラットヘッドマフラー
(EX車)

1. フラットヘッド
2. フラットヘッドマフラー
3. ハーフカット

T100 e. 1. 2. 3. 2. 1. 4. 5. フラットヘッドマフラー
2. 3. 1. 2. 4. 5. フラットヘッドマフラー

会員登録			会員登録	
平成 6年 1月 1日 金		午後 4時 4分		
品質保証部第3室質問室			TEL(2467)	
会員登録			S	L
会員登録	会員登録	会員登録	会員登録	会員登録
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(会員登録) 用意時 (アコスモス)

(会員登録)

1. フラットヘッド (アコスモス)

- ① フラットヘッド (アコスモス)
- ② フラットヘッド (アコスモス)
- ③ フラットヘッド (アコスモス)
- ④ フラットヘッド (アコスモス)
- ⑤ フラットヘッド

(アコスモス)

2. 高級車

NN-B44

- ① ハイエース (高級車)
- ② " "

3. 神奈川県の地域

NN-21

地域の地域 (神奈川県の地域)

~11/1

4. 落葉 (高級車)

NN-B1

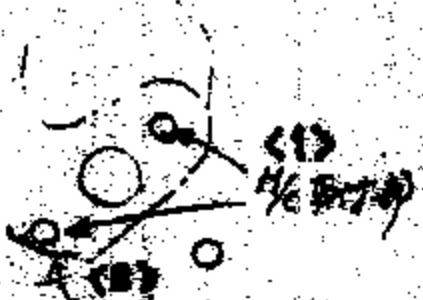
11/2

2月 13日 14:00 ~

会員登録

1. 機器研究

ATX 254. DCK20-0001R-25 X'p'g'g'g' 40006
 DCK10-0004R-25 X'p'g'g'g' 40005
 T110 119 DCK20-0002R-25 X'p'g'g'g' 40006



22.7% C取合部(下部)、上部
 部部 A-A 22.7% C取合部
 15.7% C取合部
 (上部) 22.7% C取合部

總(次元起點、上部) C取合部

COM 11.6-7.11.17 78.7% C取合部

2. 產品調查・技術研究

(1) 内装物・評価結果

○ノットナム・導入部、DCK20-0002R-25 (40006)
 ○ノットナム・導入部、DCK10-0004R-25 (40005)

(2) 総合結果

22.7% C取合部 - 22.7% C取合部
 (上部) C取合部

(3) 備品・機器

22.7% C取合部 - 22.7% C取合部

(4) 一括算出結果 - 実績 (7.5) 対比

22.7% C取合部 - 22.7% C取合部

(5) T100 & 113 & 279 33.7% C取合部 - 22.7% C取合部 T100 113 279 472 51 52 (2) (45.9%) 22.7% C取合部 - 22.7% C取合部 (2)

**DRAWINGS AVAILABLE UPON
REQUEST**

(page 1)

<1> T100 clutch master cylinder attachment dash panel cracking countermeasures meeting

<>

1. Failure status
2. Survey of causes and discussion of countermeasures
3. Actions to be implemented.

<> Request form to be issued QM2 - Overseas Service - TCH (TMSC)

Meeting to discuss the programme determining the causes of cracking failure in T100 clutch master cylinder attachment dash panel to date, and establish actions to be implemented.

Summary

According to evaluation results from development stage, as well as current survey results, it appears that something has caused significant force to be applied to the pedal, leading to the damage. Further information is required, however, to make conclusions.

Action to be implemented.

- 1) Confirmation of the failure conditions (collection of information regarding failure)
 - (1) Recall of failed parts from Capita (master cylinder, release cylinder, clutch)
 - (2) Information regarding use of failed vehicle (was it used in any particularly unusual way?)
 - (3) Photograph of failed parts (Start at holes? Fatigue or instantaneous?)
 - (4) Force on pedal data (F-S characteristics)
 - (5) Conditions of non-failing vehicles
(Deformation of attachments, force on pedal data etc.)
- 2) Reconstruction testing
 - (1) Test of deformation before dash panel change HN-BHK, by end of November
 - (2) Test of deformation after dash panel change HN-HHK, by end of November
- 3) Investigate repair methods HN-B1, by end of November
Countermeasure proposals from design for the future failure
- 4) Discussion of countermeasures (proposals) HN-B1, to be discussed

Next meeting: 7th December, 14.00 onwards.

(page 8)

1. Failure conditions

Canada 2 incidents: VCK900001420, line-off 21 Sept 1992, 401,000 km

VCK100004606, line-off 21 Oct 1992, 300,000 km

America 1 incident: VCK20-05000050, line-off 16 Oct 1992, 27,884 miles

<=> Master cylinder attachment

<=> Cracking (not clear whether this has occurred round hole or not)

<=> If confirmed, could indicate gear formation failure - this is possible.

Clutch master cylinder attachment (underside) panel has cracked. This means that the clutch start switch will not come on and the engine cannot be started. (The engine can be started using the override switch).

2. Survey of cause / discussion of countermeasures

1) Results of evaluation at development stage

(1) Clutch pedal operation durability: Fails on pedal 20% of 1.4 million times need
Specification was less than 1 million) OK

(2) Pedal bracket strength: All parts OK for stroke at 8000 cm per sec 22.5 kgf

2) Process of change in specifications

No changes between evaluation of prototype and June 1992. July 1993: change implemented to shaped cylinder. (Possible effect on current fails ~10)

3) Condition of sheet metal in current model

Damage not likely to be caused by press or stamping fixture errors

4) Current model fails on pedal - displacement (F=0) characteristics

No particular problems for n=3 assessment

5) Comparison between sheet metal displacement during shear separation of T100 and that of Wilux

- T100 has higher displacement than Wilux (approx. 5 times)

- Particularly large displacement to force on pedal of 1.5-1.8 kgf

(page 8)

<> Daily report

<> Distributed to

<> Time

<> Name

<> Appointments

<> Mr. Tanaka

<> 840T expansion concept DR

<> Nobody out of the office

<> Absent: Mr. Miura (annual leave)

<10> Reporting items

<11> T100 market failure (dash-panel cracking) countermeasure meeting

In addition to the 2 incidences in Canada, a single incidence has been reported in a product report from the USA. Meeting to discuss action to be implemented.

(1) It is thought that these cases are occurring outside the bounds of normal use.

As a result, a survey request is to be issued Q32 - Overseas Service - TCI (TMS)

- Request Canada to return affected parts (master cylinder, clutch - check situation of clutch itself)

- Request measurement of force on pedal (F-S characteristic) - if necessary send tools (G-32)

- Check deformation conditions of dash on vehicle with no current problems - BHX test shows slight deformation.

(2) BHX reconstruction test - by way of precaution, carry out test by temporarily

- tightening bolt on current model moved forward and to the rear by 2mm in each direction before and after design change - until deformation.

(3) In order to avoid concentration of stress, discuss countermeasures proposal

- including local repair methods (by end of November - B1)

(page 4)

Cracking in dash panel of T100 Clutch Pedal Bracket attachment

1. Relationship between force on clutch pedal and distortion of dash panel

(1) Normal circumstances

- <1> Location of part measured for distortion
- <2> Force on pedal
- <3> Contact with floor
- <4> Carpetless
- <5> Stroke
- <6> Contact with stopper
- <7> Normal usage
- <8> Stroke
- <9> Stopper contact force

(2) When the stopper is not touched (power input by master cylinder only)

Measurements taken with release cylinder in locked position.

- <10> Relationship between force on pedal and distortion occurring to dash panel
(with stroke forcibly locked)
- <11> Distortion
- <12> TS experimental force on pedal
- <13> Force on pedal at full wear

2. Confirmation of dashboard cracking limit (reconstruction experiment)

- (1) 0 <-> 25Kgf 2 million times used, no cracking
- (2) 0 <-> 30Kgf Currently testing (2 million times used: OK (some deformation))
Test to establish point at which cracking occurs

3. Future schedule

- (1) Inference of damage mechanism
- (2) Survey of damaged parts
 - details of cracking

- deformation of dashboard
- dimensions of parts related to attachment of master cylinder
- force on pedal
- condition of release cylinder

- A: During pedal stroke, force on pedal is 12Kgf
- B: Pedal touches floor at almost same time as touching the clutch (switch) and on stopper approx. 15Kgf
- C: Distortion is not made particularly greater by touching floor
→ Crushing does not occur as a result of maximum force on pedal.

Reference: Increase in distortion when supported by stopper

- <14> Board spacer
- <15> Power to travel switch (dash pad touch floor)
- <16> Contact with stopper
- <17> Power level from stopper position gives increased distortion
- <18> If pedal bracket does not come into contact with dash panel, the distortion from steering bracket power input is increased.
- <19> Power to travel switch
 - A: Distortion increases as result of increase in distance between top of dash pad to floor on clutch
 - B: When fully worn, 180Kgf ± 1.5 (disposition): 20Kgf
Equivalent to 20Kgf in normal conditions
 - C: Plastic deformation shown at over 25Kgf on pedal (disposition conditions omitted)
 - Possibility that damage occurs as result of contact of floor on pedal due to sliding failure of release cylinder (in mostly or front wheel conditions)

Reference: Assumed force on pedal used to determine durability development

- <20> Durability

(page 5).

T195 clutch pedal bracket attachment dash panel cracking countermeasure and repair methods

- <1> Countermeasure policy
- <2> Countermeasure proposal
- <3> Details of change
- <4> Pending issue
- <5> Note
- <6> Specification evaluation
 - <7> Rehabilitation of concentrated stress on the cracking area of the dash
 - <8> Increase contact area of shoulder bolt
 - <9> Max. value so as not to induce deformation in pedal bracket
 - <10> Shoulder bolt
 - <11> Pedal bracket
 - <12> Dash
 - <13> Clutch cylinder
- <14> The attachment surface of the clutch master cylinder is $\phi 18$. Increasing the contact area of the shoulder bolt to $\phi 19$ means that it fits the diameter thereby increasing stress concentration even further. Not useful.
- <15> Addition of patch to dash attachment
- <16> Patch attachment (SIL)
- <17> Problems with P.L. (related to changes in specification after line-off)
 - <18> Ø² Diameter: Addition of patch to pedal bracket side under consideration (use as bolt position supporting part?)
 - <19> Shoulder bolt - spacer and bolt
 - <20> Weld bolt (standard part)
 - <21> Spacer
 - <22> Since the contact surface of the spacer is smaller than that of the shoulder bolt ($\phi 18$), it is ineffective as a countermeasure. (Spacer diameter cannot be increased due to lack of room for welding)
 - <23> Change P.L. problem if purpose is VE.
 - <24> Ø² Diameter: shoulder bolt and spacer = same cost, so no cost benefit

- <34> Addition of one further pedal bracket tightening bolt
- <35> Addition of tightening bolt
- <36> No space for tightening tools (possibly could be done with spanner?)
Problem with P.L.
- <37> Repair method carried out in current cases (Canada)
 - 0* December: Will this be effective in the operation of the switch? Currently being checked (CHECK)
 - <38> Reduce size of dash attaching hole diameter
 - <39> Bolt contact surface min. play - 1.2 to 2.7
 - <40> Pedal bracket and dash bushes need checking for provision
Only marginally effective
 - <41> More certain tightening of cowl parts
 - <42> Change of cowl part tightening bolt from transacted-one point (present) to one with sides
 - <43> Cowl
 - <44> Cowl bracket
 - <45> Pedal bracket
 - <46> A: needs to be checked for ease of work
 - <47> 0* December: A checked, no effect
 - <48> Increase in pedal bracket hole diameter, to ensure that it does not overlap with the cowl hole if the hole moves.
 - <49> Bolt washer diameter $\phi 22$
 - <50> Current design reliability (1-tightening bolt)
Needs to be discussed, including brake pedal side, in terms of included in design specifications.
 - <51> Correct local repair method
 - <52> Addition of washer to pedal bracket attachment
 - <53> Addition of single pedal bracket tightening bolt
 - <54> Additional washer ($\phi 2.5$, t1.6)
 - <55> Pedal bracket moves to left-hand side as far as the thickness of the washer, so cowl tightening hole diameter will need to be increased, and a washer introduced (spacer)
 - <56> Additional tightening bolt
 - <57> Spacer
 - <58> Pedal bracket

<48> Dash

<49> Flange change

<51> Needs change to flange of dash tightening additional part.

Needs confirmation of effectiveness as countermeasure

<52> Used as repair method in Canada

Attachment 6.3



1946年6月1日

No.

内閣印第

取扱区分

ナタリ

○印: 内容に
問題項あり

配布先 数

内閣印第

件 1

昭和11年6月1日 金 2 4時 14分

品川駅前交番 G TEL (1946)

高 長 S L 手 無

14時

4時

8時

12時

16時

20時

24時

0時

日 時 平 6月2日 (火) 4時 ~ 16時

場 所 }

出席者 } 21人 事務室

（2）昭和11年6月2日午後4時半から午後8時半まで

（3）昭和11年6月2日午後4時半から午後8時半まで

1. 品川駅前交番
2. 品川駅前交番
3. 品川駅前交番
4. 品川駅前交番

（4）1. まよの

内閣印第 6月2日午後4時半から午後8時半まで

内閣印第 6月2日午後4時半から午後8時半まで

内閣印第 6月2日午後4時半から午後8時半まで

内閣印第 6月2日午後4時半から午後8時半まで

内閣印第 6月2日午後4時半から午後8時半まで

2. 品川駅前交番

(1) 品川駅前交番

① 品川駅前交番 TC 1. TEL 8108

② 品川駅前交番 (1946.6.2)

~ 14時 ③ 品川駅前交番

② 品川駅前交番

品川駅前交番 TC 1. TEL 8108

HN

~ 18時

③ 品川駅前交番 (1946.6.2)

HN

~ 18時

(1) (内閣印第) 品川駅前交番

内閣印第 6月2日午後4時半から午後8時半まで

内閣印第 6月2日午後4時半から午後8時半まで

(2) 品川駅前交番 (1946.6.2)

品川駅前交番 TC 1. TEL 8108

品川駅前交番 TC 1. TEL 8108

品川駅前交番 TC 1. TEL 8108

321212 上記の内閣印第 14時 18時 21時

(page 1)

To all related departments

<>> (Subject) Minutes of meeting held to discuss response to cracking of T100 clutch master cylinder attachment dash panel

<>> (Agenda) Follow-up from meeting on 21st November

1. Latest information in regard to failure
2. Results of reconstruction experiment
3. Results of considerations regarding repairs
4. Action to be implemented

<>>

1. Summary

It is thought as a result of the reconstruction experiments, that a gap appears in between the bracket and cowl inner attachment, causing excessive force to be placed on the dash panel, leading to fatigue fractures. Since it has not been possible to identify whether this gap is due to tightening failure or due to looseness, it will be necessary to perform further surveys, as well as recall the parts in question. Further action will be determined according to these results.

2. Action to be implemented

1) Identification of cause of failure

(1) Survey of tightening torque of cowl inner on affected vehicles

TCI and TMS to test 10 vehicles each, from around July 1993

(2) Recovery of pedal brackets (from 2 Canadian vehicles)

Q&S to Overseas Service Division (add to previous request document) - aim to complete survey by end of January.

(3) Prediction of failure occurrence

Possibility of tightening failure or bolt looseness HN - by end January

(4) Summarise background to countermeasures for pedal bracket tightening part

HN - by end January

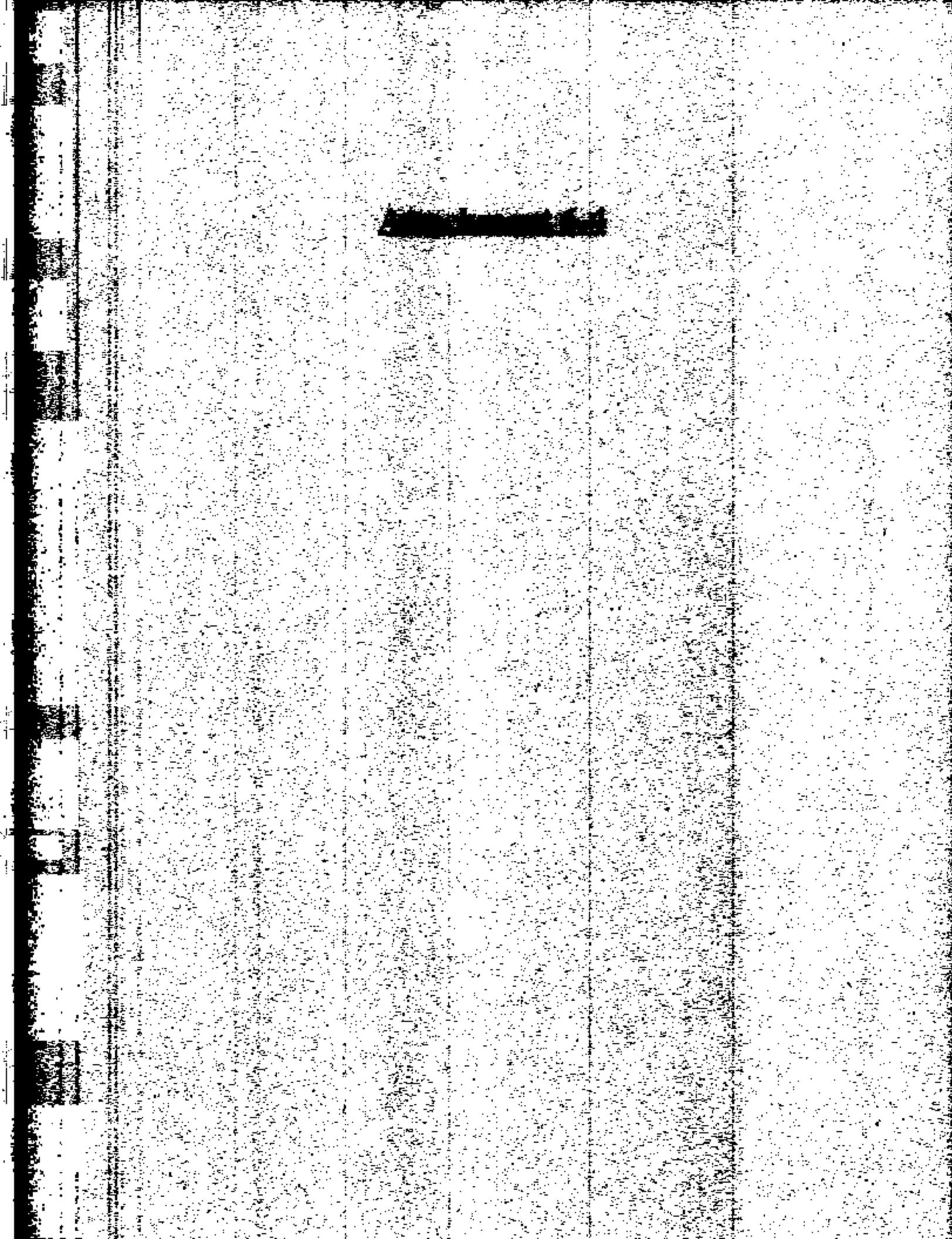
2) Repair methods for further occurrences of same problem

Repair method for cracked part: Insert washer or patch and assemble pedal bracket
(does not require creation of work request form)

3) **Disposition** (for present models and vehicles already sold)

Costs of delivery and insurance, production of future parts, and losses from discontinued components may be defined for present models and vehicles already sold. An adjustment based on actual parts should, however, be changed immediately to save possible production losses.

Note: Pending for the last time results of surveys described above and -- between and after
January and March 1968.



件名	発行日
連絡事項	受付日
T100	94年12月28日

(1) 連絡書

受信者	発信者	受信年月日
品質保証部 品質保証室	小型品質保証部 情報管理チーム	北浦山 宏

連絡事項

T100

クラッチペダルBKT 沢付ケトルクの件

樟記の件、組付け工程における締付トルク値の
状況は下記の通りでありますのでご報告致します。

(2) 記

対応時期	指定期間	ライン実績項目・ライン実力等	使用工具
92.8 (4/0)	17.5 N.m (175kgfcm) (17.5kgfcm)	Z-120 (100~130)	UX-SMD
93.2.26	カム燃焼油 ドリル頭 (17.5kgfcm)	締付管理上に難易度との ことで成績中でわざわざ 対応しないが、今日は17.5	—

回数	年月日	(3) 次回実績	(4) 次回実績
1	94.1.11	—	UX-SMD
1	95.1.未定	—	UX-SMD
1		実に安定化を経て下記の 実績を実現中。 ①トルク管理目標をトルクの 持続(±20%の公差) ②ボルタリケン設置	UX-SMD 実現

受信者	発信者	受信年月日
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備考欄

(cont'd)

<> Management

Subject:

T100 - Standardized lightning protection strategy

Proposed changes to the standard lightning protection strategy for lightning

protection of buildings.

<> Technical Committee

<> International Standard

<> IEC 62305-1:2000 edition 2000-03-01

<> Technical

<> 17.00V_{th} (0) (17.1kV/cm plus 40% 180 - 240)

Ground lightning □ equivalent to 1.44 times 17.00V_{th} (0) 19.8kV/cm
130 - 200

<> Consideration was being given to reports that there were problems with lightning control. However no changes were made to date.

<> None

<> IEC Standard 1994

Document end of December 1994

<> Protection strategies to be confirmed 1993 version (1.30 - 2000) are not suitable for use.

Protection = 100 (100 - 200) m² ± 20

Protection strategies and techniques must be confirmed by your own insurance company.

(1) Change of return stroke distance to ground control. If possible extend distance 30%

advised)

(2) Protection of open areas

<> IEC U-300/C to be incorporated

Announcement 6-5

A59

<1> <2>
<空見> [重車]

小型組立部

組立技術員丁

<3> (主担当者)
御中 (技術監修者)

松井・内山田
ラスト

P1



羽村先

原

細深

1

TP

TP

JCB

1

細深

1

細

計

5

品番<4>

品名<5>

<6>件名 T100 フラットベダル BKT 締付管理依頼件

<7>内容 機会 9/14 5/28 TMC でり方見会議にて
BKT のカカルウ締付管理変更を決定いたしました
ので、下記の様お願いします。
(決定事項)

1. 締付箇組の変更 3級 → 2級 成分 130~295 → 145~265
2. 下限トルク保証の徹底 Q1 限りの実施とし、TMC 締付管理の実施

(依頼事項)

上記 2 項目に付いて至急 実施下さい様お願いします。

注) 145~265 では出来んと車両検査のまま、次回発行さります。

品管部技術員G

御中

回答書

回答日 '97年 6月 2日

社名

部署名 [組立 部門技術員丁]

GL

答
木

① 工具規定について

使用基準のQCLシナは、締付範囲 2~3級と異
て次の ECLシナが 1.5~2 級標準となり、等級変更
対応は現状のECLシナの方が有利となる。

② 日常管理について

当初想が車両検査に実施されたから未実施でしたが、今日の可持定に伴い
日常管理を実施開始はじめ。

J-508予定

現在225達成結果 226, 227, 228, 229 (合計4台)

(ノルマ=245)

過半数をためJ-508であります。

上記該定のとくます。

受領日 '97年 6月 3日

部長 係一監 係二監 課員

X

小林

小林

(page 1)

<--> Urgent

<--> Important

<--> Memorandum / Request

<--> Part no.

<--> Part name

<--> Subject: 2100 clutch pedal bracket tightening control request

<--> Details: In regard to the above, it was decided at a countermeasure meeting at TMC

on 29th May that the bracket and cowls tightening control should be changed.

Please make the following responses.

(Decision value)

1. Tightening grade to be changed from grade 3 to grade 2, specification 130 - 275
changed to 140 - 285 (unit kg/cm)
2. Strict adherence to lower level guaranteed torque - implement use of QL wrench
and strict adherence to tightening control

(Responses)

Please implement the two items above immediately.

Note: Specification changes and inspection method changes will be issued within
the next few days.

<--> Response form

<-->

(1) In regard to designation of tools

The QL wrench described in the request form is suitable for tightening grades 2-3, while the EC wrench is suitable for grades 1.5 - 2. In regard to the grade change mentioned, we recommend the continued use of the EC wrench as most advantageous.

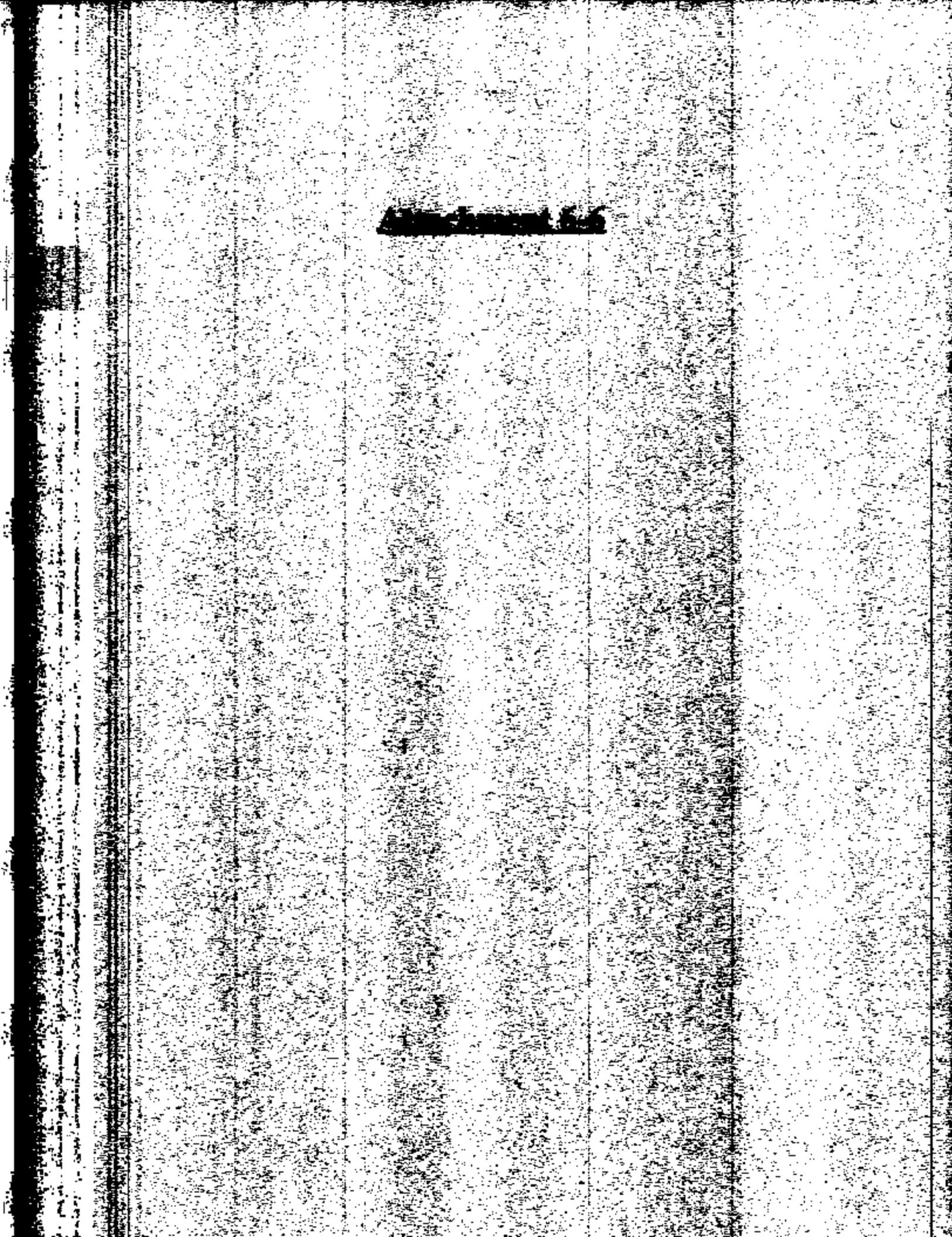
(2) In regard to day-to-day control

An \checkmark designation was not originally included in the instructions for standard vehicle inspection. As a result of the \checkmark designation issued in this memo, we have begun to implement day-to-day control.

N = 50 vehicles (projected)

Currently 26 have been tested:

At present results look good, so if N = 50 is acceptable, the specification given above
will stand.



内閣府大臣・内閣官房長官
内閣官房内閣官房長官
内閣官房内閣官房長官
内閣官房内閣官房長官
内閣官房内閣官房長官

関係各位

平成元年7月19日 全1ページ中1ページ

品質検査部機械課機械課長 HN第3G TMS-2970

提出書類

件名

No.2T100 クラッチベア検討結果



件名

①故障状況

②修理検査結果及対策実績

③

○用: 内容に

記載事項あり

94年10月ごろT/Sにより試験実施時 (3.0kg×20.0万回) BKTが満足しているのに今度のHN及びHXの試験結果により (条件: 負荷2.5Kg) 3.2万回時用サポートとベースに異常が発生する。下記の観察・対策を至急に実施。

記載先

監

I. ボルトゆるみについて

- ①締付け不足: 締付力管理 (100kgf-mm3級) で初期開始 6月5日～実施済み
- ②締固め表示トルクを上げるの検討 ～8月連休前 HNB 1 (B.3)
- ③クーンオーバーBKT取替
 - ・再プレスにより平均破壊強度の拡大 6月8日～実施済み
 - ・平均破壊強度の拡大 (底面) 8月連休前 HNB 1 (B.3)
- ④ボデーとクラッチBKT単品の取付面精度調査 ～7月末 小糸品管 (HN品保)

II. BKT強度不足について

- ①クラッチBKTのサイドサポート (アーム) 板厚アップ検討 (底面) HNB 1 (B.3)
- ②サポートフランジ強度検討 (底面) ～8月連休前 HNB 1 (B.3)
- ③サポート尺部を小さくする (底面) ～8月連休前 HNB 1 (B.3)

III. 運転感覚

沈み感強調 ～7月末 小糸品管 (HN品保)

号口品との違い ～7月末 小糸品管 (HN品保)

IV. 不具合性確認 (結果は8月連休前)

運転状況の詳細調査 (部位、長さ、写真等) 海サ→TMS

沈みモードの感覚 海サ→TMS

不具合率の能力測定 海サ→TMS

本件、関係各位の早急なる対応をお願いします。

8/初打合を予定

7/100 72.4 ベニララテ

9% 24.10.20 13:10 ~ 25.20)

E307

出港港	航 线	航 次	(付合)
三井物産三井	○	内港	4-922
三井物産 26	○	宝塚	-
HN品保小笠原船TP + 品保TP	○	大阪本郷	2024-2025
4J-344	○	名古屋	3-1146
品保金杯	○	横浜和馬	3-3514
2N	○	大坂	
品保 Q22	○	福岡	3-2422
II	○	大阪水門	3-2429

(page 1)

To all related departments.

<1> Subject

Minutes of No2T100 clutch pedal examination meeting

<> Agenda

(1) Status of countermeasure implementation

(2) Results of reconstruction experiment survey and consideration of countermeasures

<> Despite the fact that in October 1994 TS tested the bracket (30kg 2 million times used) and found it satisfactory, the results of these tests on HN and BHX show that at 25kg force on pedal, the support and base crack after 320,000 times used. The following surveys and countermeasures are to be implemented immediately.

I. Bolt looseness

(1) Insufficient tightening: Tightening control (185kgf/cm grade 2) to be introduced – implemented as of 5th June.

(2) Investigate raising torque on instruction diagram – to be done before August long holiday – HNB1 (B3)

(3) Turnover bracket surface sagging

- Increase in size of flat surface through re-pressing – implemented as of 6th June.

- Increase in size of flat surface (change of specifications) – to be done before August long holiday – HNB1 (B3)

(4) Survey of precision of body and clutch bracket individual part attachment surfaces – by the end of July, Small Parts QC (HN Quality Assurance)

II. Insufficient bracket strength

(1) Considering increase in sheet metal thickness for clutch bracket side support (arm) (change in specifications) HNB1 (B3)

(2) Considering lengthening support flange (change in specifications) – to be done before August long holiday – HNB1 (B3)

(3) Make right hand part of support smaller (change in specifications) – to be done before August long holiday – HNB1 (B3)

III. Study of current part

Confirmation of looseness status – by end of July, Small Parts QC (HN Quality Assurance)

~~Establishment of Service Division - current model -- by mid 1980's~~ ~~and Part 3 QC Model~~

~~Quality Assessment~~

IV. ~~Survey of all Joint service companies before August 1980~~

~~Statistical study of current circumstances (Joint service, etc.)~~ ~~Overseas~~

~~Service Division to include TMC~~

~~Establishment of Service Division~~ ~~Overseas Service Division to include TMC~~

~~Establishment of Service Division~~ ~~Overseas Service Division to include TMC~~

~~Establishment of Service Division~~

~~Establishment of Service Division to include TMC~~

~~A Dispersed organization proposed by Headquarters Australia~~

Attachment 6-7

<1>

<2>

会議

アサヒテクノロジ

会員名

10.2 T100 フィルターラ 開幕対策会議

出席者

Goto, EN, 渡辺
品川営業所, 34号
内、
B4X 品保TF

開催日時(月) 10月13日 10時~15時30分

開催場所

決議事項・期限

目的)

相次ぎについて第2回目の会議を行い。
今後の方向づけとする。

<昨日の行動>

開発テスト段階における不確執でペルブレラ

取付ボルト及びナット不足が考案されたため、

次の検討事項を実施する。

(1) ペルブレブレットの構造アップ。 (参考図面～7枚)

① ブレースのリフ角度 上部リフ角度～7度

② ブレースの底面アングル 9.44→1.6 ～7度

③ 形状変更 R25mm→20mm ～7度

④ カウル側の取付角度 Rカウル量を減す ～7度

⑤ ペルブレブレット装着角度 基本角度～7度 小品

⑥ 取付角度 本丸側角度～7度 脚材

(2) 国外品の調査

① カウル側への取付ボルト寸法 変更寸法～7度 小品

② 純正部品調査 取付ボルト寸法～7度 "

(3) 市場の不適合状況 対応方針

③ ブラシとペルブレ 増設 どうしたか

④ 取付ボルト走行の状況 おまけで取付する

⑤ 電気

(4) その他

1. その後一市場情報 (2箇所)

新たな情報として2件、1件は取付ボルトの増設

1件はペルブレ取付用ブレットの溝削出し(スカルプト)

<2> / <3>

2. 爆破テスト結果 (BNK) 資料-1参照

・ヘッドランプの燃費は、カウル側面の形状によるものか
主原因、させると燃命が1/2に低下。

3. 対策 結果 (CAE 開析)

ベースの構造 大きさ→1/4で燃費が改善
燃費不十分で10名以上したのは

4. 対策結果

ベースの板厚アップ、カウル側面形状改善等
ベースの形状要因等が必要

3. フィル性能検査 (Q32) 資料-2参照

'92年～現在までの合計ム56件 100% = 100.0%

'94年～ " 4件 " = 0.25%

Cカブ立上り以後が苦手

4. その他

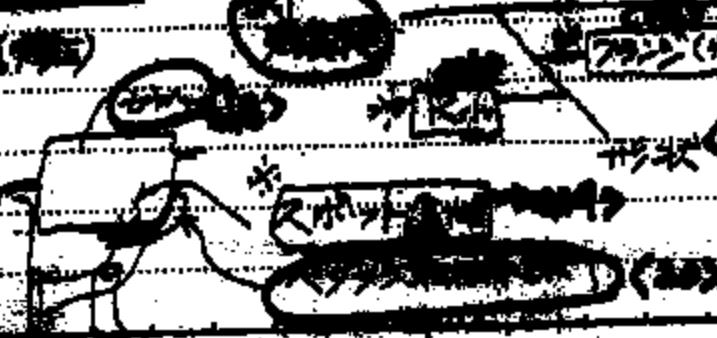
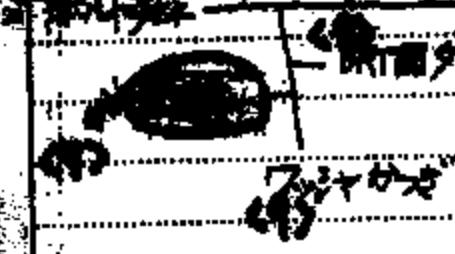
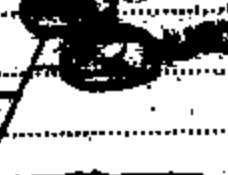
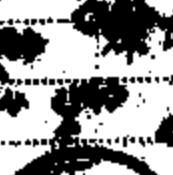
・爆破テストの中で強力25kgとある。とくに強度検査 B
(カウルでない車両の強度がドンと落ちること有り)

・強度15kgでテストしているが、TSの許容強度では、
15kgまで保証する上に在り。

・強度オペレーター

・強度オペレーター

<強度検査で必要な物>



日野重工
ボデーシャシ RE 部 BHX
佐々木

T 100 ペダルプラケット対策

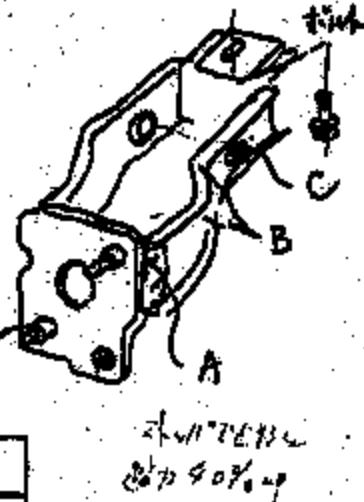
1) 再現テスト

カウル側取付ボルト弛みの影響

【操作耐久】

正規 (T=185kgf·cm)			弛み
	15kgf	25kgf	15kgf
A	○	✗ (32万回)	✗ (30万回)
B	○	○	○
C	○	○	○
D	✗ (200万回)	✗ (32万回)	✗ (30万回)

130kgf



【応力測定】

正規踏み / 斜め踏み(約 10°)

部位 側方 方位	正規 (T=185kgf·cm)		
	15kgf	25kgf	15kgf
A	1300/1030	2025	3300
B	2100/1400	3830	2000
C	(130)/(200)	(400)	(700)
D	(500)/(430)	(750)	(600)

() 値が真値か
モニン

(結論)

龟裂の原因：カウル側取付部の弛みが主原因であり、弛むと寿命が 1/7 に低下する。
斜め踏みは影響ない。

件番号 6
10% 減少実績

wall 4

(壁面減少)

寿命 2~8倍

2) 対策効果 (CAE 解析)

部位	オリジナル	対策工	判断
A	1	0.5	○
B	1		×
C	1	0.84	×
D	1	0.65	○

板厚 UP OK

不足

操作耐久で最終判断

45K / 1.5 年

3) 対策効果

① ドル側取付部の耐精度向上 ... 6 / 条 ~

② フケットのベース板厚アップ (1.2 → 1.4t) ... 6 / 条 ~
上側でも5mm 増設を実入2回

③ サポートの形状変更 ... 7 / ~

ねじ (頭部追加) が付いている。

以上

対策工 → 1-2 + 4-24

対策工 → 1-12 + 1-18 または 1-17 + 1-18?

(2) 2 926.30

之五~

R - 2.916.3020442

Y - 1151722.541442646

现代

1000000000

+ <0000000000000000000> 10000-Lm

82650

82-3 ~

R - 2.916.3020442

Y - 1151722.541442646

1000000000

Item 1)

- **Objectives of meeting:**
 - Subject: TECNIS should provide technical assistance to the government of Argentina
 - Purpose: This second meeting on the subject allows to discuss the following topics in the future.

Documentation on this meeting:

Show the documentation that and the confirmation of cooperativeiveness of government has increased its resources and available strength to the pedal basket mounting belt, the following conclusions have been reached upon.

1) Design:

- 1) Increase in pedal basket strength: addition of metal to pedal attachment basket, by end of July.
 - height of bypass ribs; increase in height of ribs to meet the above. End of July
 - increase in thickness of the metal used for basket: 1.14 mm. End of July
 - change in shape of basket under the revised suggestion by end of July
 - flat part of arm: low the required interference, by end of July

2) Manufacturing:

- 2) Pedal basket individual part production: precision survey, by end of July. Small Parts QC
 - 3) Pedal basket attachment precision: body-side survey, by end of July. Body 2
 - 4) Survey of sealed parts
 - Flange of attaching bolt to oval side: check for looseness, by end of July. Small Parts QC
 - Individual parts: precision survey: comparison with original and new parts, by end of July. Small Parts QC

3) Overall Survey:

- 5) Detailed survey of market before discontinuation:
 - Body / pedal tracking
 - Limitations of attaching bolts
 - Force on pedal

Whether it is possible to get measurements that will allow accurate judgment to be made

(Overseas Service Division)

<10> Results of meeting

1. Subsequent market information (Overseas Service Division)

2 new incidences, of which one showed no bolt looseness

One incidence of weld failure on pedal bracket attachment (spot dislodged)

<11> Next page

(page 2)

2. Results of reconstruction test (BHX) See reference material 1

1) Cracking of the pedal bracket is caused mainly by looseness of the cowl side attaching bolt. Loosening of this bolt causes a reduction of 1/7th of the part's durable life.

2) Effectiveness of countermeasure (CAE analysis)

Base sheet thickness increase from t 1.2 to 1.4 was considered, but due to lack of sufficient effect, it was raised by only 10%.

3) Countermeasure proposal

Increase in sheet metal thickness for base as well as cowl side attachment surface precision, and change in brace formation required.

3. Weibull analysis results (Q32) See reference material 2

Line off 1992: 56 complaints to date (100,000 km = approx. 0.3%)

Line off August 1994: 46 complaints to date (100,000 km = approx 0.35%)

Slightly higher rate since start of C cab

4. Other

- Reconstruction test was done with force on pedal of 25kgf; necessary to study extent (possible that extremely heavy people have been pressing hard on pedal)
- Testing is being done with force on pedal at 15kgf, but TS offers guarantee to 35kgf in evaluation standards. Perhaps this should not be guaranteed. Needs consideration
- Can tightening torque not be raised to 250kgf/cm? Needs consideration

<1> Items marked with * are related to design specifications

<> Bolt looseness

- <> Tightening torque insufficient.
- <> Axial tension specification insufficient
- <> Cap-specified torque not be attained?
- <> Precision of attachment surface.
- <7> * Axis model
- <> Bracket sagging (corrected 5° down)
- <> Washer interference
- <10> End of flange t 1.2 to 1.4
- <11> * Base
- <12> Sheet metal thickness
- <13> * Axis
- <14> Bracket strength insufficient
- <15> * Flange (rib) length
- <16> * Right side (small)
- <17> Formation
- <18> Cowl
- <19> * Specified
- <20> Pedal bracket attachment bracket

(page-3)

<1> Reference materials 1

T100 pedal bracket countermeasures

1) Reconstruction test:

**The effect of clearance in the cowl side attaching bolt
(Operating durability)**

- <> Tightening
- <> Normal condition (T=185kgfcm)
- <> Loosening
- <> Force applied

- <> Location:
 - >> (2-million times)
 - <> (800,000 times)
 - <> (800,000 times)
- (Steel reinforcement)

<10> Normal force on pedal / ultimate force on pedal (approx. 10 degrees)

(Conclusion)

Cause of cracking: The main reason is the loosening of the oval-hole attachment. Loosening of this part reduces durability by 17%. Oillage-free coating had no effect.

Case 4

1) Effectiveness of countermeasures (CAE analysis)

- <> Location:
 - <> Original
 - <> Countermeasures
 - <> Baseline

Final decision based on operating durability

40,000 hours / 1.5 years

2) Countermeasures procedures

- <> Improvement in prevention of oval-hole attachment of surface coating components
 - <> Improvement factor has decreased from 1.2 to 1.44 end-of-life period
 - <> Change in direction of elongation Judy towards

End.

Example 3:

→ ~~Urban traffic~~

Registration: ~~U.S. vehicles owned~~

Registration delay distribution: ~~Ref. 3.~~

Vehicle ownership costs: ~~Ref. 3.~~

Annual vehicle maintenance costs: ~~Ref. 3.~~

→ ~~Non-urban traffic~~

→ ~~All traffic~~

→ ~~Interstate traffic~~

→ ~~Highway 91 → 80~~

→ ~~Urban traffic~~

Registration: ~~U.S. vehicles~~

Registration delay distribution: ~~Ref. 3.~~

Vehicle ownership costs: ~~Ref. 3.~~

Annual vehicle maintenance costs: ~~DIAGNOSTIC~~

→ ~~Augmented traffic~~

→ ~~Highway 91~~

Attachment 6-8

市場不具合調査結果報告書

年	月	日	那次番
97	7	25	松 浦 清 水

T100	シルベターブラ爆裂回収品調査	部位コード	003
		部位コード	003

フレームNo.:	別紙	車両:	一	ライセンス番号:	別紙
車両メーカー名:	日野	登録年月日:	別紙	回収登録番号No.:	一

不具合内容

近畿 市場不具合に対し、回収品を入手したので、
状況の調査を実施する。

調査結果概要

回収現品入手状況

・ 無

1. 回収品: フラットペダルアブレット 総数: 134

品番: 55107-34010

2. 回収品の状況: 46日 '96.12月～'97.2月 (24ヶ月間)
走行キロ 17,287キロ～39,865 (~)3. 調査結果: 詳細は別紙参照。 (51枚) 1/6～16/6
回収品を観察した結果 下記の通り。

① 集積発生状況

- ・回収した左アブレットの全数が ベースの左サポート取付部上側に爆裂が見られる。(写真)
- ・サポートでは左側の中央部にNo.31爆発発生しており完全に破壊しているものもある。 反面 右側サポートにはダメージはNo.3付近に見られない。

② カウル側面縫付け面の状況

- ・アブレットのカウル側及びフッシャ側の面の破壊跡から回収品のほぼ全数がこすれ跡がある。

③ フッシャ寄り面 平面鏡ルフレでは 1ヶを除き他全てにカット跡有

4. 所感: 今回の調査結果からダメージの大半が左側に集中しておりペダル操作により左側に应力が集中し爆発に至ったものと推察され

**DRAWINGS AVAILABLE UPON
REQUEST**

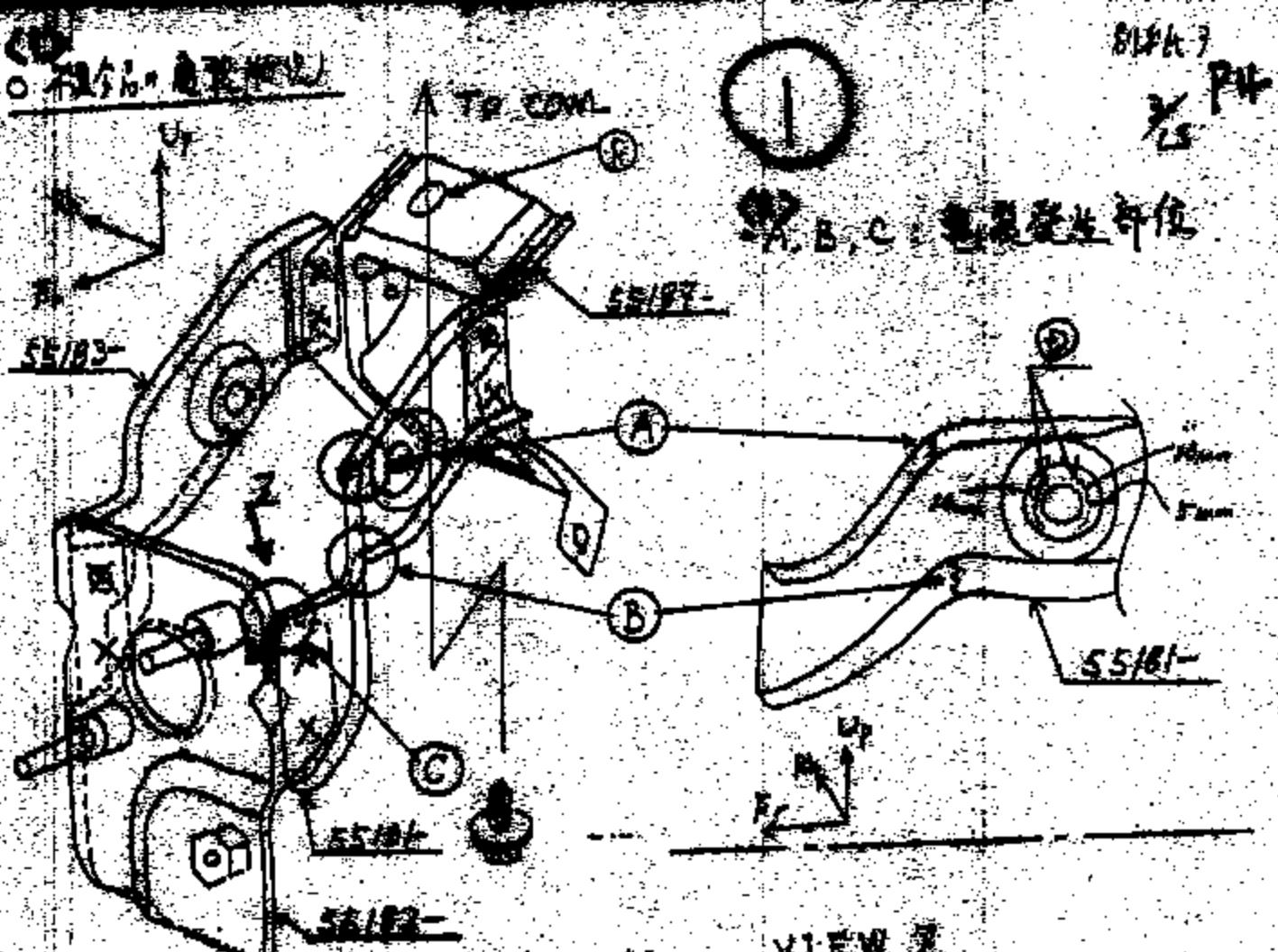
O: 電子管
二: 管

81960 X6 1/6 PDA

T100 9L ベテラ 回收品調査(概略)

THF 97008

No.	TV-L No. (番号)	76	走行時間 (km)	走行時間 前回調査時刻 ベース(月)(日)	BKT 各種運転状況心臓			
					前回調査時刻 ベース(月)(日)	走行時間 前回調査時刻 ベース(月)(日)	走行時間 前回調査時刻 ベース(月)(日)	走行時間 前回調査時刻 ベース(月)(日)
1	JT4FD12893 0010004 (CZEKIL-CRNSKA)	95 4/17	24808	X O X X O O				
2	JT4FD12893 0010056 (CZEKIL-CRNSKA)	96 4/17	24402	X O X X O X				
3	JT4FD12893 0011700 (CZEKIL-CRNSKA)	96 5/12	32856	X O X X X X				
4	JT4FD12895 0010088 (CZEKIL-CRNSKA)	96 12/13	-	X O X X O X				
5	-	-	-	X O X - O X				
6	JT4FD10017 0010079 (CZEKIL-TURKA)	96 10/18	36,981	X O X X O X				
7	JT4FD10055 0005546 (CZEKIL-CRNSKA)	96 1/13	-	X O X X O X				
8	JT4UN26011 0019015 (CZEKIL-CRNSKA)	95 10/5	19,017	X O X X O X				
9	JT4FD10017 0010079 (CZEKIL-CRNSKA)	96 2/19	-	X O X X O X				
10	JT4UN22007 00200189 (CZEKIL-CRNSKA)	95 1/61	17,287	X O X X O X				
11	JT4UN24825 0019261 (CZEKIL-CRNSKA)	95 1/9/0	22,361	X O X X O X				
12	JT4FD20040 0001547	-	-	O X X O -				
13	JT4FD1147 0008226 (CZEKIL-TURKA)	96 3/13	-	X O X O O X				



VIEW 2

52/81 - (2)

52/82 -

55/61 -

55/62 -

R

Up

図55/61- 増加装着形状

→ 55/62-TC つまみ棒

アーチングスクリュー R

表面と平行に取付下さい。

55/63 フラップ板と、固定金具

55/64 フラップ板、固定金具

図55/61

10

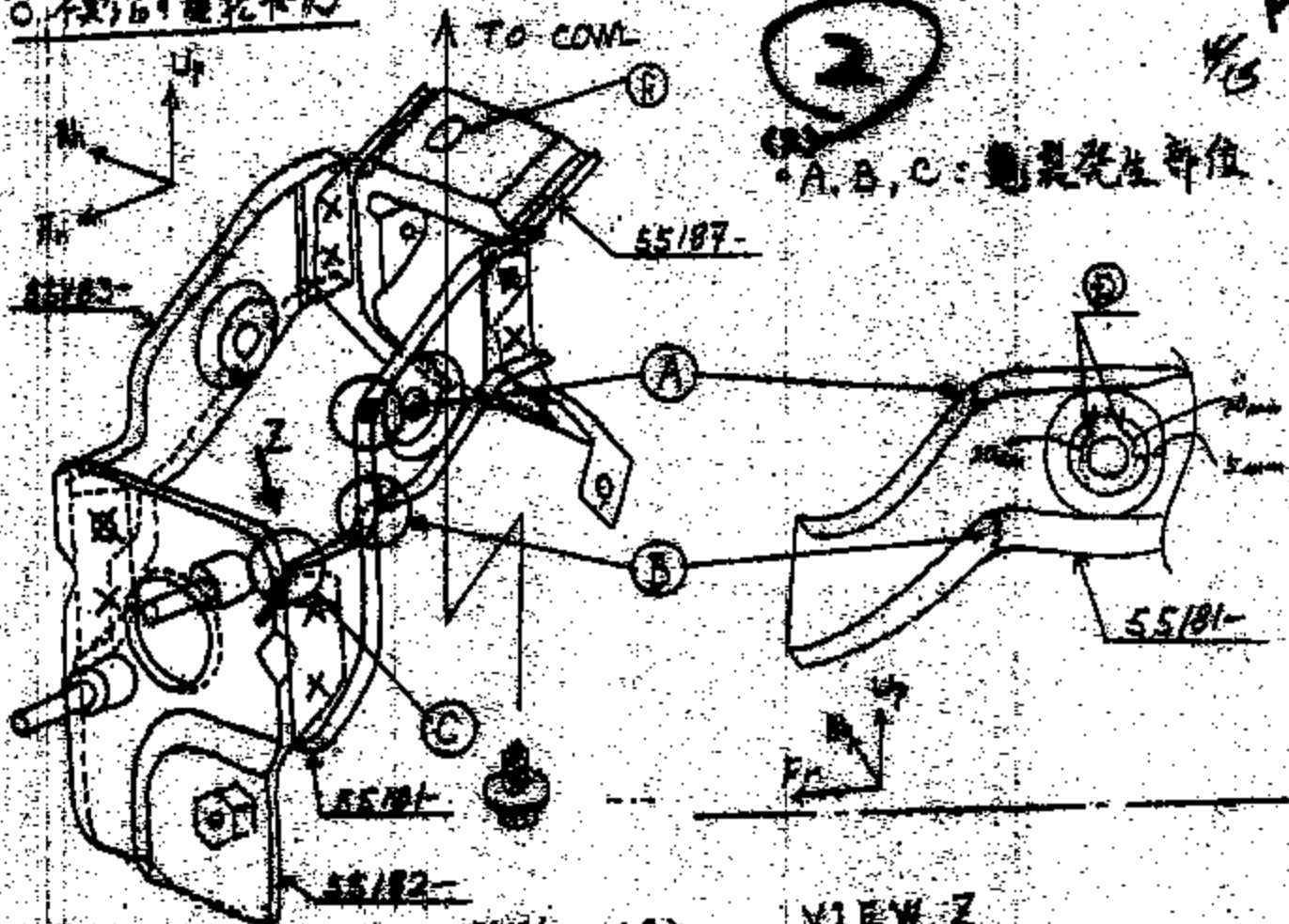
10

55/61 固定金具

55/61-L	55/61-R	W	55/61-L	55/61-R
L	R	mm	55/61-L	55/61-R

812A3 PS

43



55/82-

52/81- (2)
52/82-

VIEW Z

55/81-

55/82-



□(2) I = 38mm 異常形状

(4)

55/82- に付いては、

アラウンドルバーフィルム

異常であると見えて、

アラウンドルバーフィルム

アラウンドルバーフィルム

アラウンドルバーフィルム

アラウンドルバーフィルム

①, ②

③

④

⑤ 他の用意

PIR: L 82~93
4~5mm

10mm

20mm~26mm~5mm

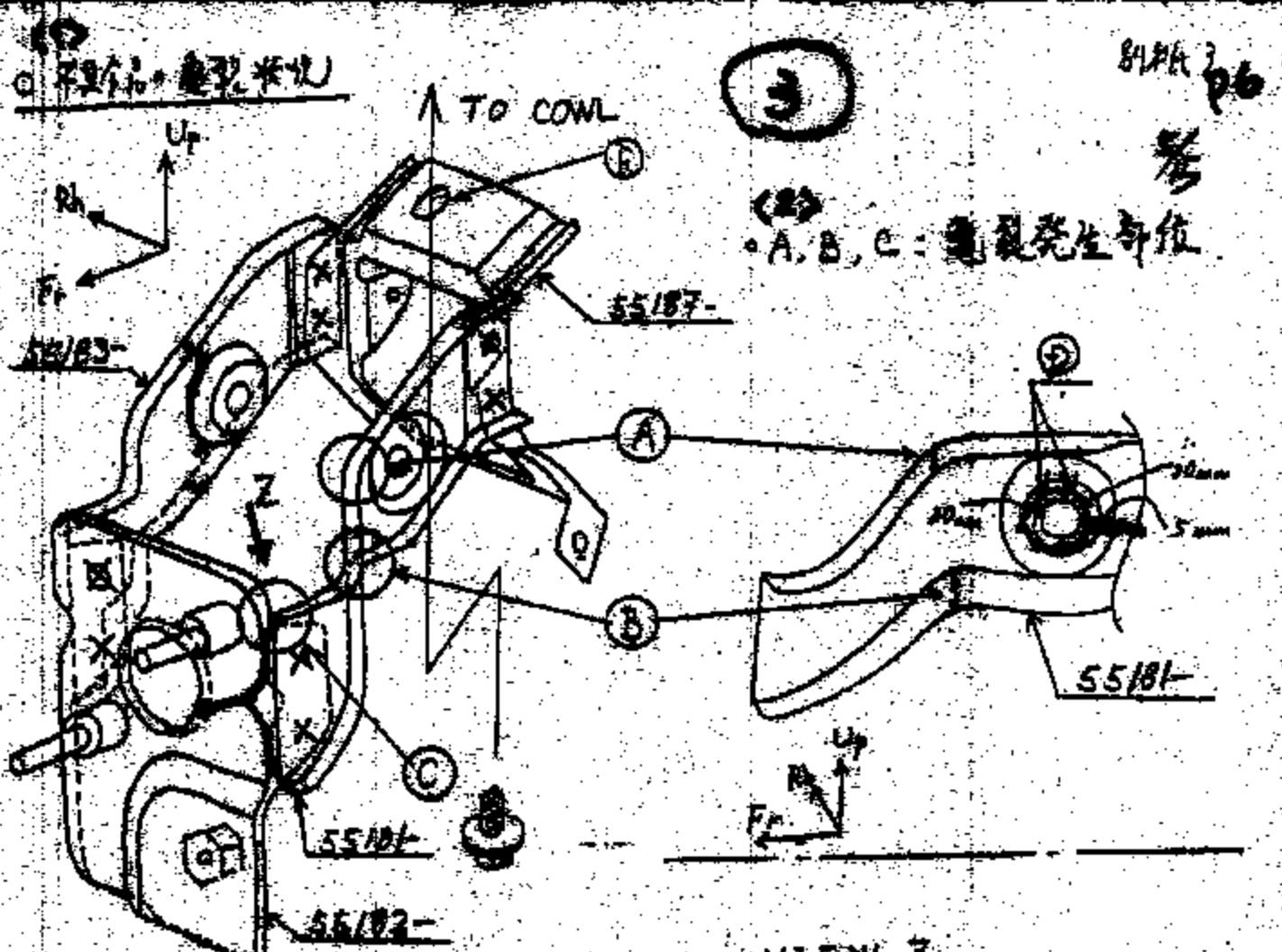
序孔大

PIR: L 5~8mm 45mm

45mm

51> 51L (?)

計測室



◎ 水素ガスの発生場所

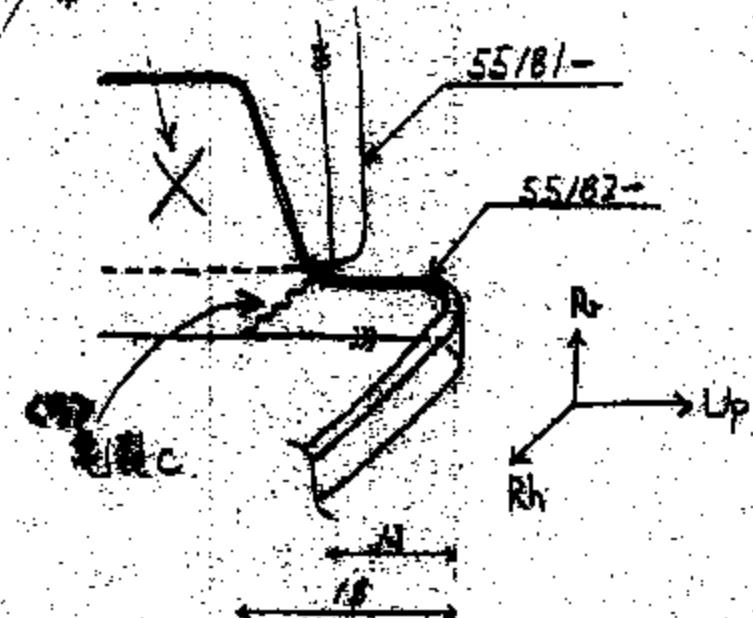
-55/82-に付けては、

フランジ部とコネクタ

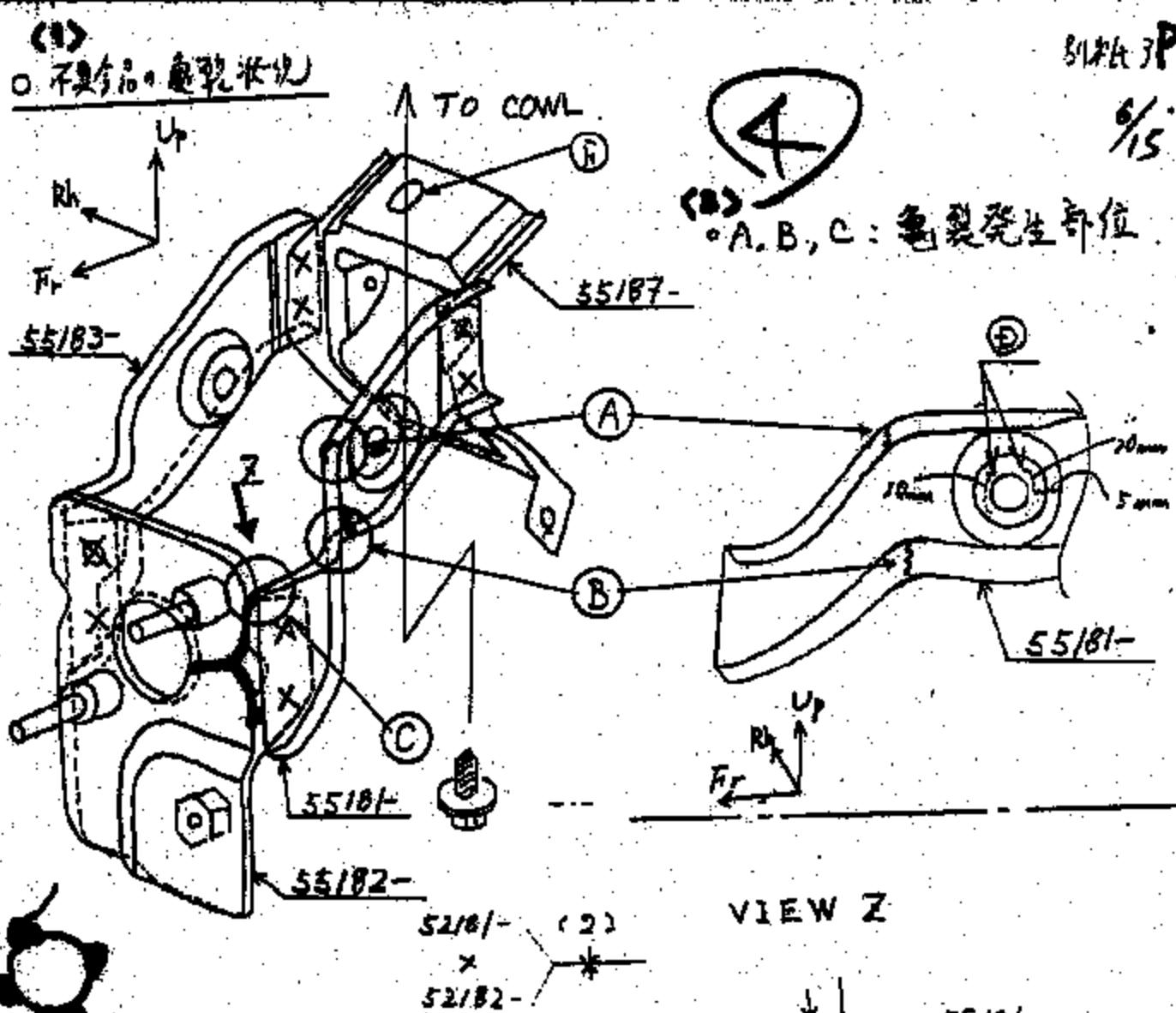
周囲において発生している。

-55/83-付近では: 水素ガス

が発生する場所である。



	A	B	C	D	E	F
距離 L	3m	4m	10mm	20mm + 20mm = 40mm	7.5m (7)	7.5m (7)
	水素ガス	水素ガス		水素ガス	水素ガス	水素ガス



(4) 回收品Iの場合の製品形状

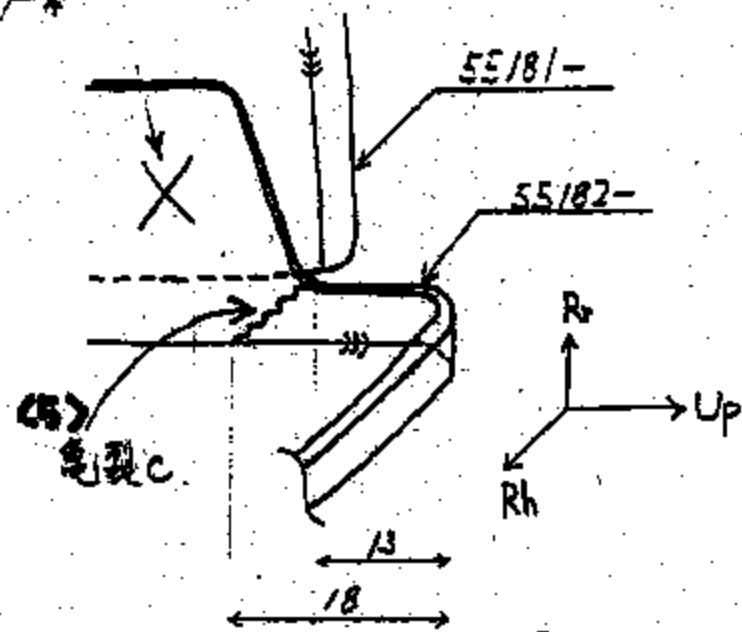
(4) 55182-につきでは、

クランク及びコートR

周面において出来ている。

・55183 クランク部2: 開口部面。

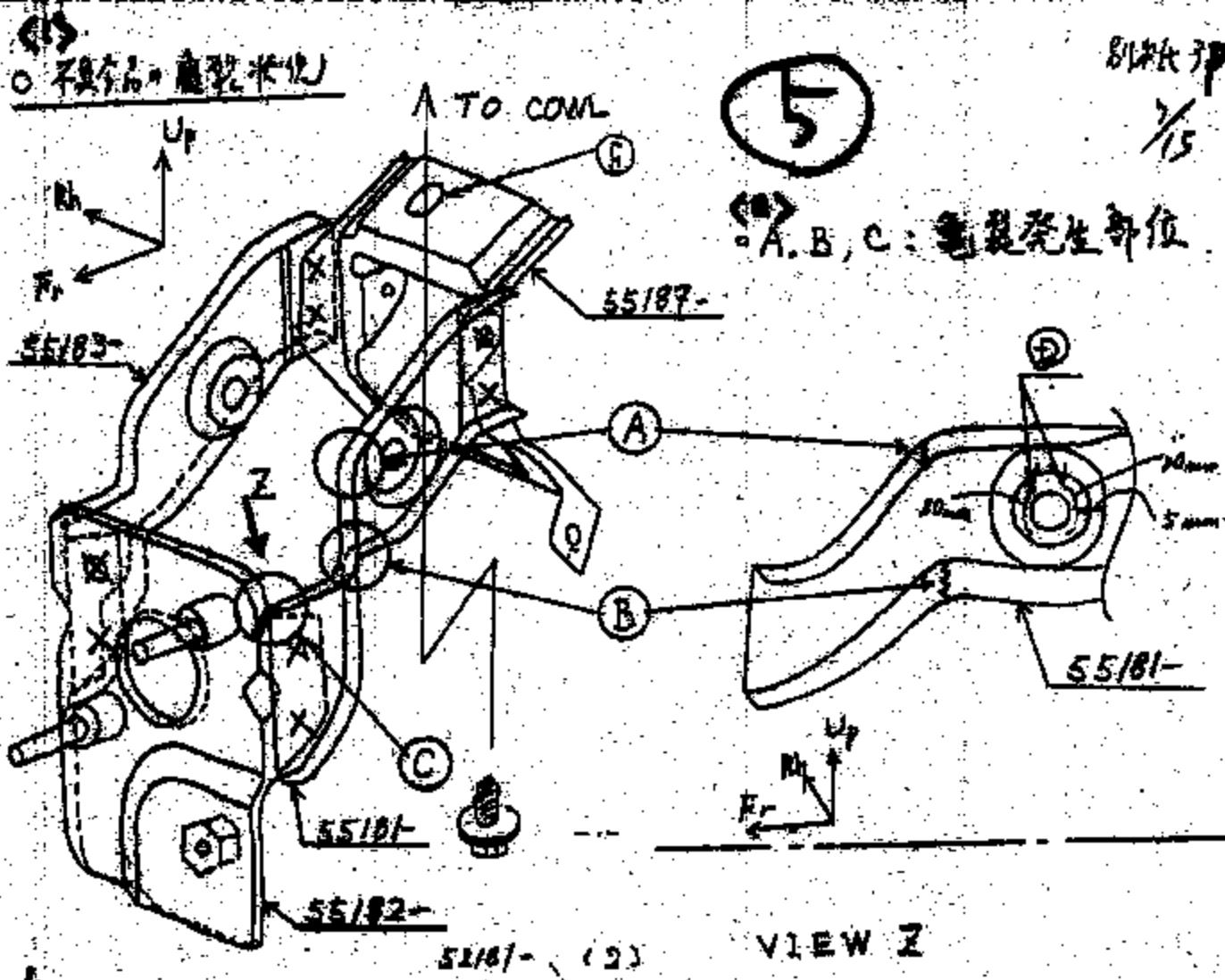
・55181 クランク部2: ハブ部外周。



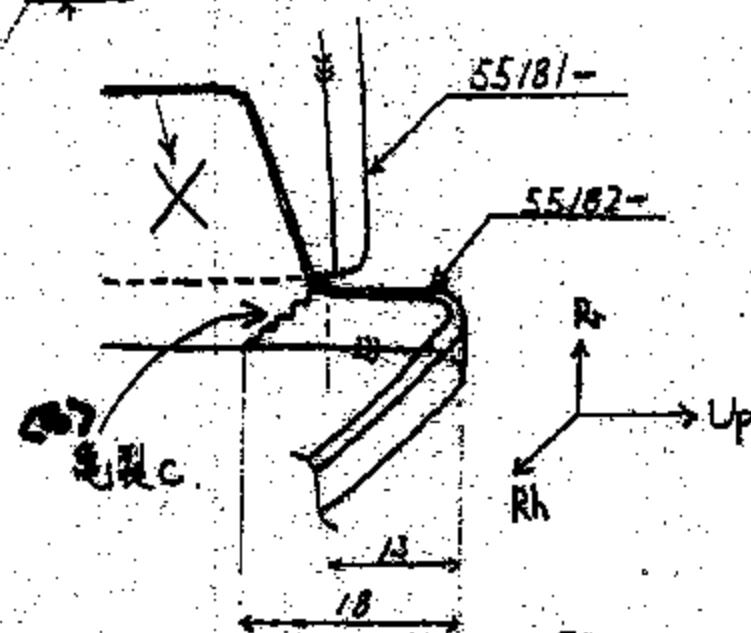
	(A), (B)	(C)	(D)	(E) 製品測定値
(6) 部品I	壁厚 4~5mm	10mm	20mm+20mm+5mm	(9) 厚越太
II	3~8mm	45mm	(11) 7mm (?)	(10) 調査

812K3P0

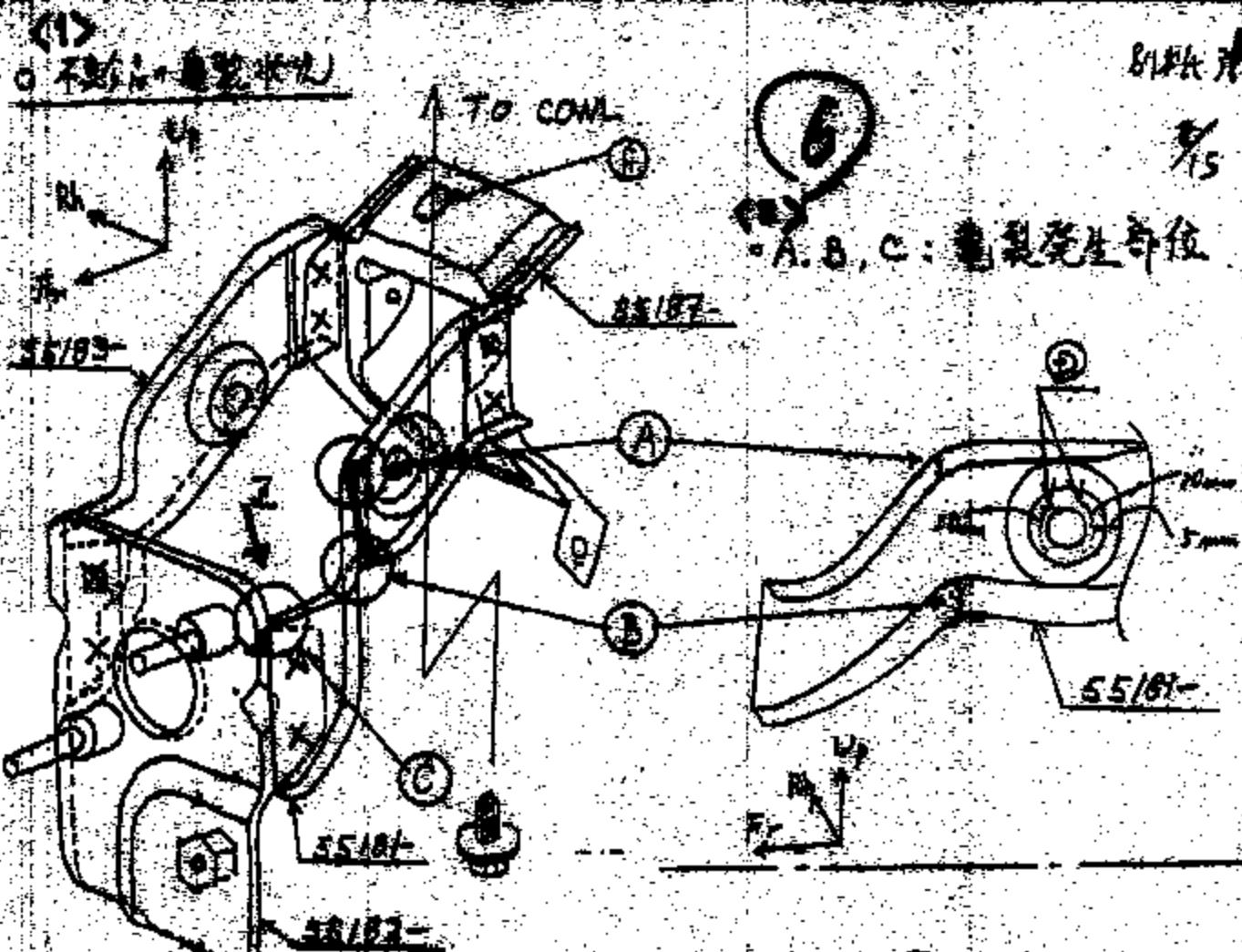
7/5



(3) **雪被りの場合、機体形状**
 (4) **55182-1C** にて
 フランジ部にコート-R
 面面とおりに出来ていい。
 フランジ部の長さ: 50mm程度
 厚(1) 7mm程度, 12mm程度。



	(A), (B)	(C)	(D)	(E) 付属機材
(6) 厚さ L	5~5.5mm	10mm	20mm~20mm	付属機材
E	5~8mm	45mm	付属機材	付属機材



VIEW 2

52/81- 121

52/82-

回路I = 電子制御系

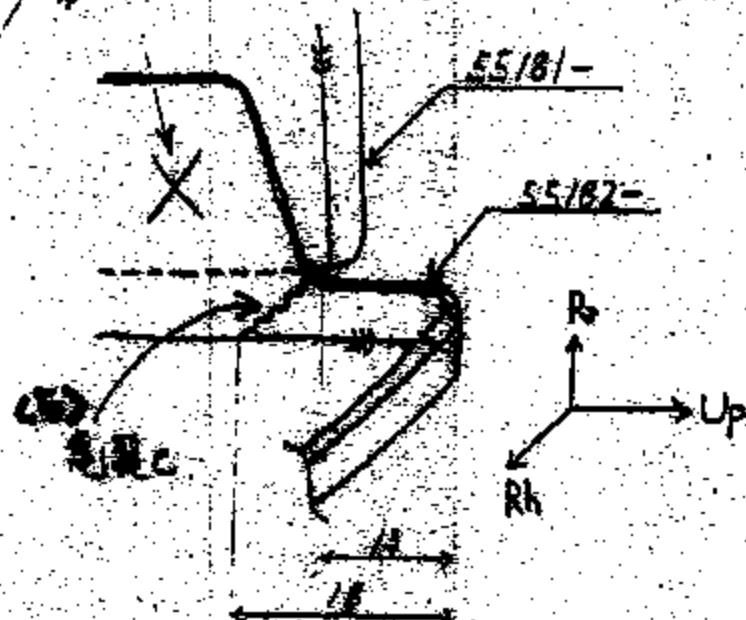
① 55182-1C にては、

ランプルバージ+R

開閉とありた出来といふ

車内ランプ等： 7個回りか。

車外ランプ等： 4個回りか。



	④, ⑤	⑥	⑦	⑧ 加熱器停止
回路I	4~5mm	10mm	38mm+3mm+5mm	停止
I	5~8mm	45~	(?)	無効

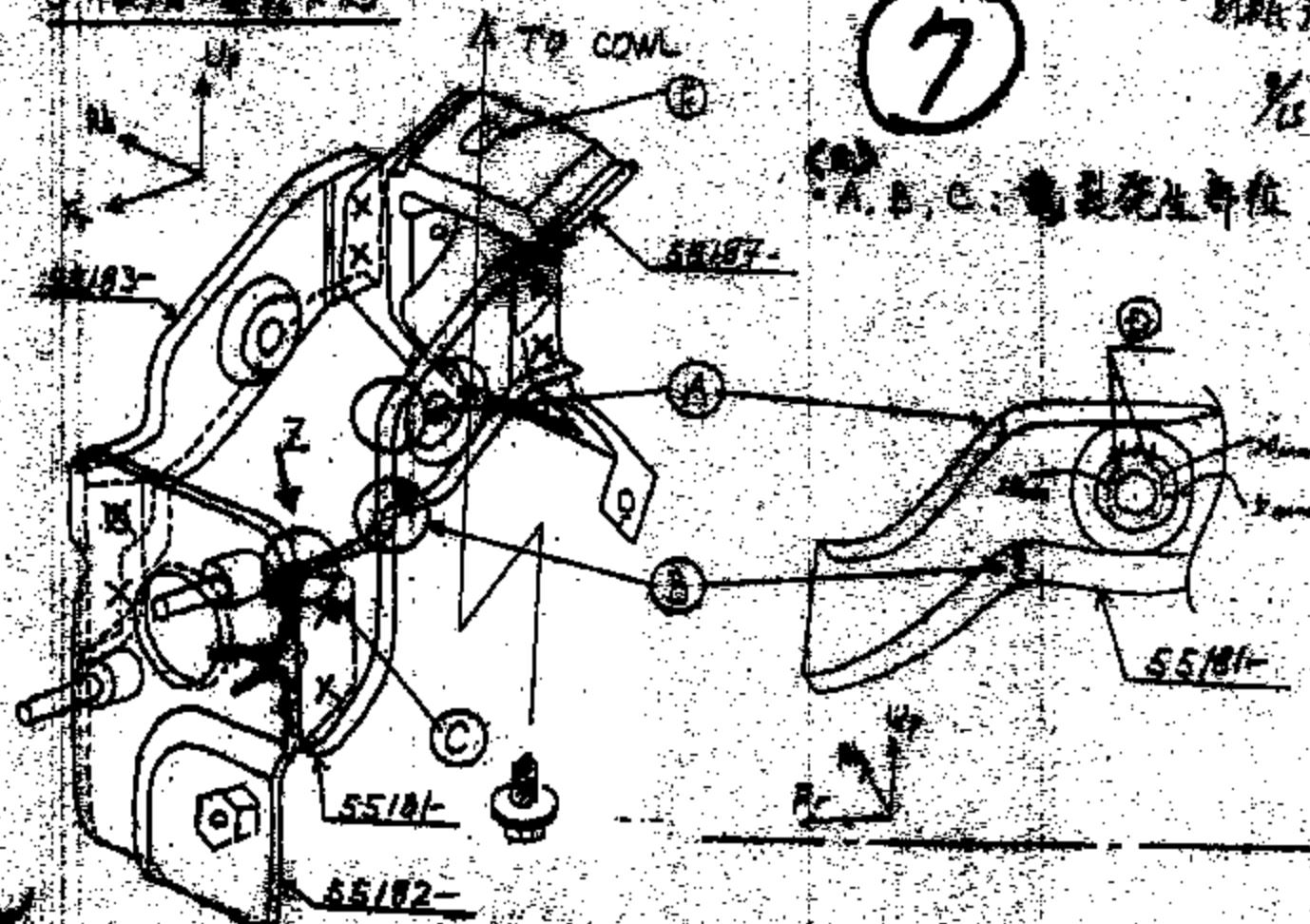
9. 不動・静止部

ATO COWL



8000 PRO

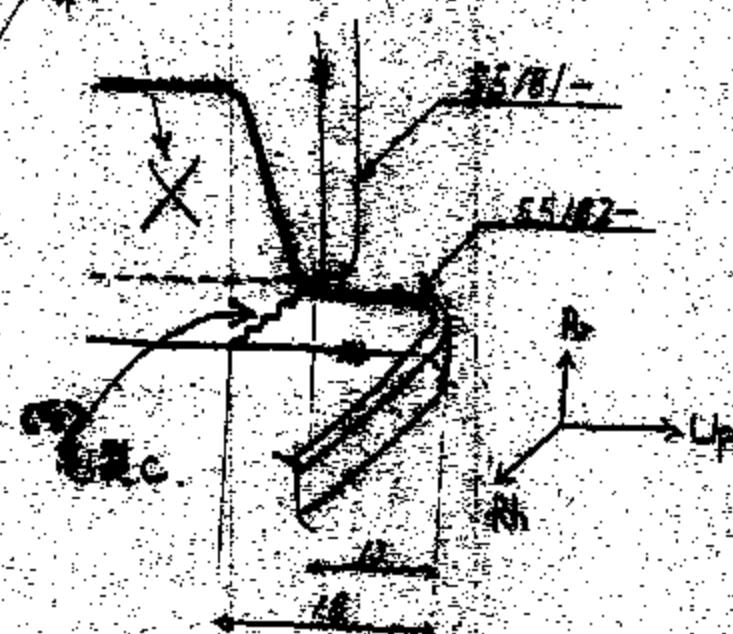
%



9. 不動・静止部

- 55182-1C 24V DC
- 24V DC 電源供給
- 電源供給回路を確認する
- 電源供給回路を確認する
- 電源供給回路を確認する

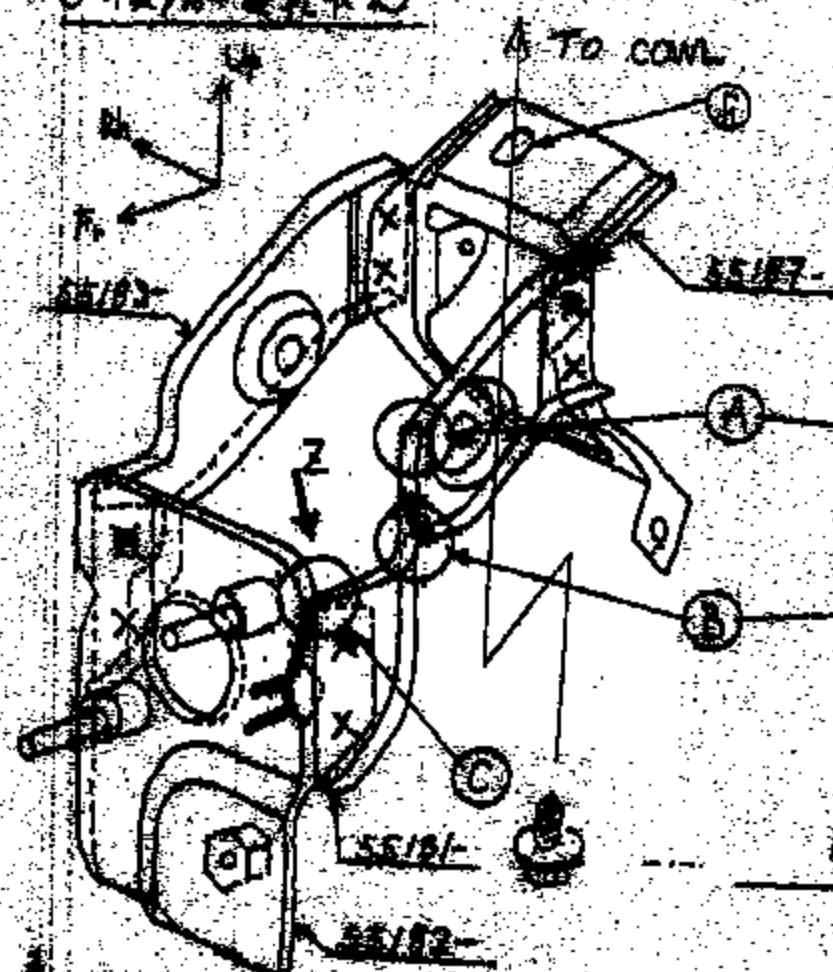
55185 (2) VIEW 2



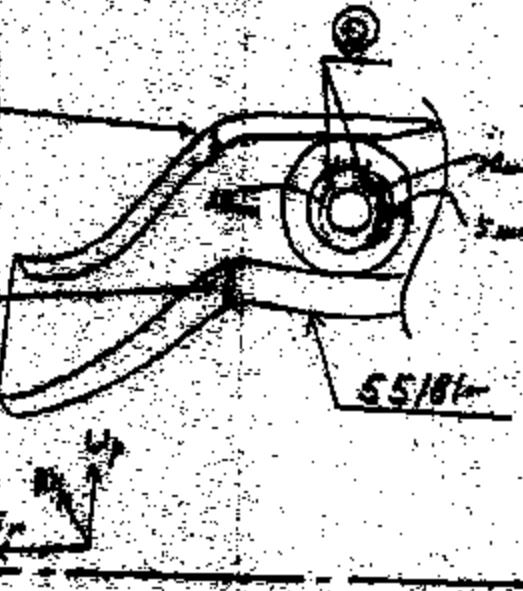
①	②	③	④	⑤	⑥
Φ42 φ1.5	Φ22 φ1.5	10mm	20mm+20mm+5mm	Φ12 φ1.5	Φ16 φ1.5
E	5mm	45°	(1)	JL (?)	GJ 3mm

Q3

○ 7月1日 機器検査



(a) A, B, C: 電翼発進部位
10%
1/5



VIEW 2

○ 4月1日 機器検査

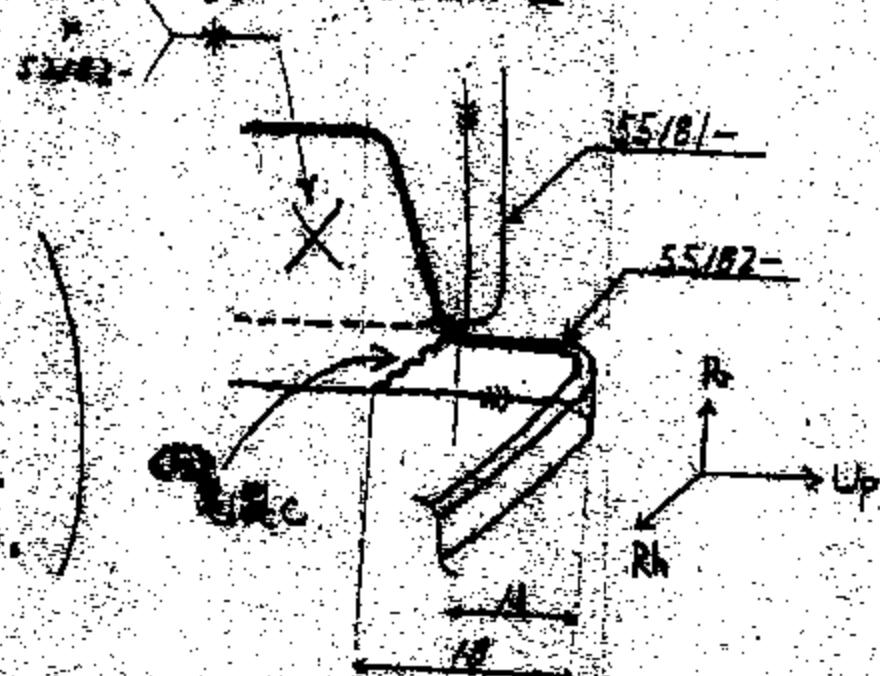
Q4
○ 5月1日 機器検査

スプリング リバース フック R

表面 ざらつた 破損あり

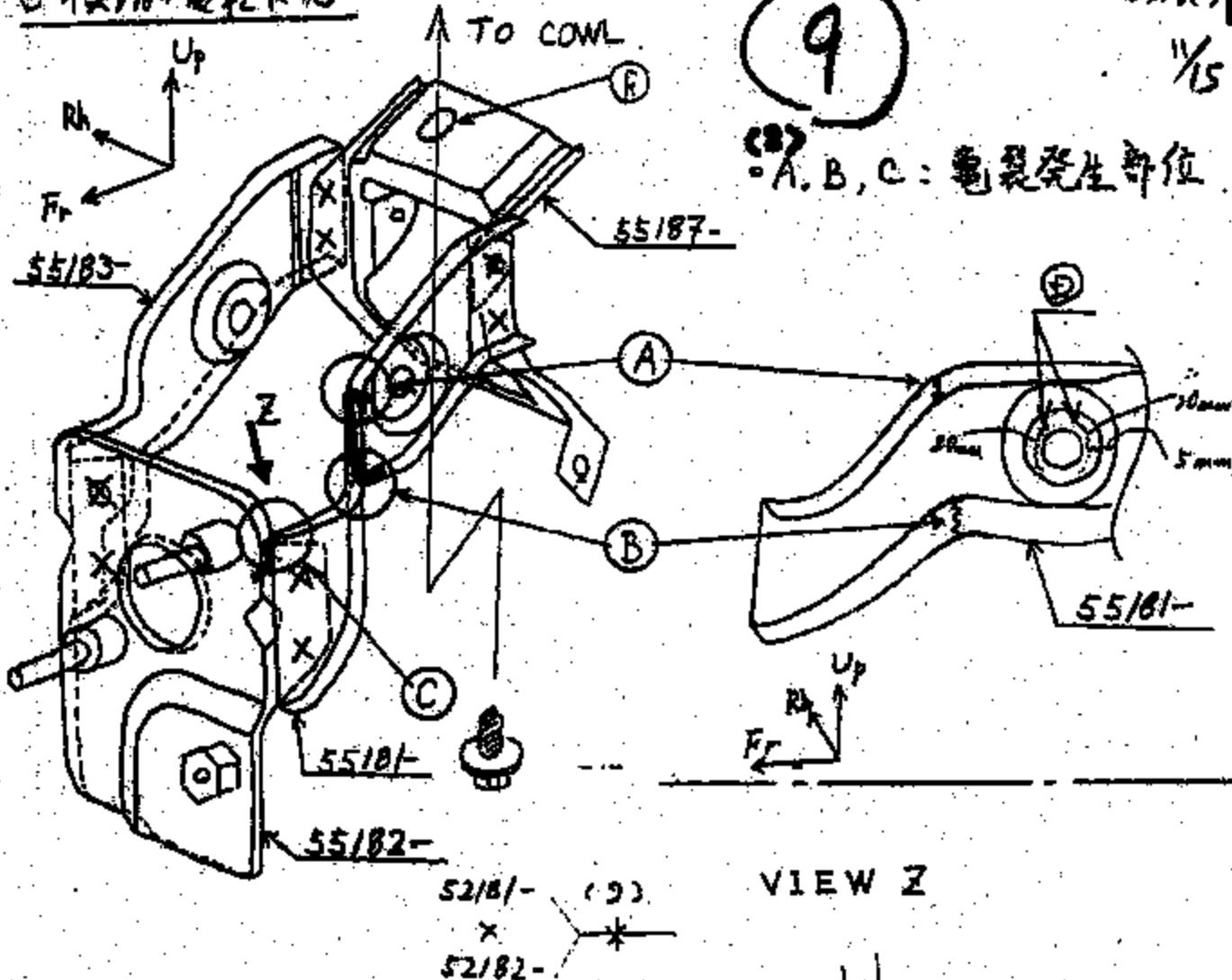
○ 5月1日 ハンドルスイッチ: 機器検査

○ 5月1日 7月1日 機器検査



| ○ 5月1日 機器検査 |
|-------------|-------------|-------------|-------------|-------------|
| ○ 5月1日 機器検査 |
| ○ 5月1日 機器検査 |

① 不足品・腐蝕状況



② A, B, C: 腐蝕発生部位

③ ①の場合の製品形状

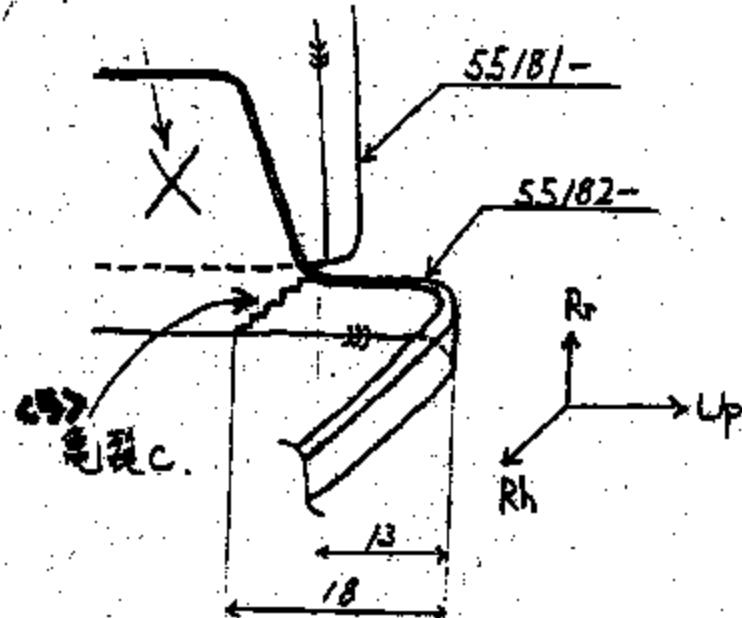
④ 55182-については、

フランジ部とコネクタR

両面において出来ています。

・55183 フランジ長さ: 16mm面面1.

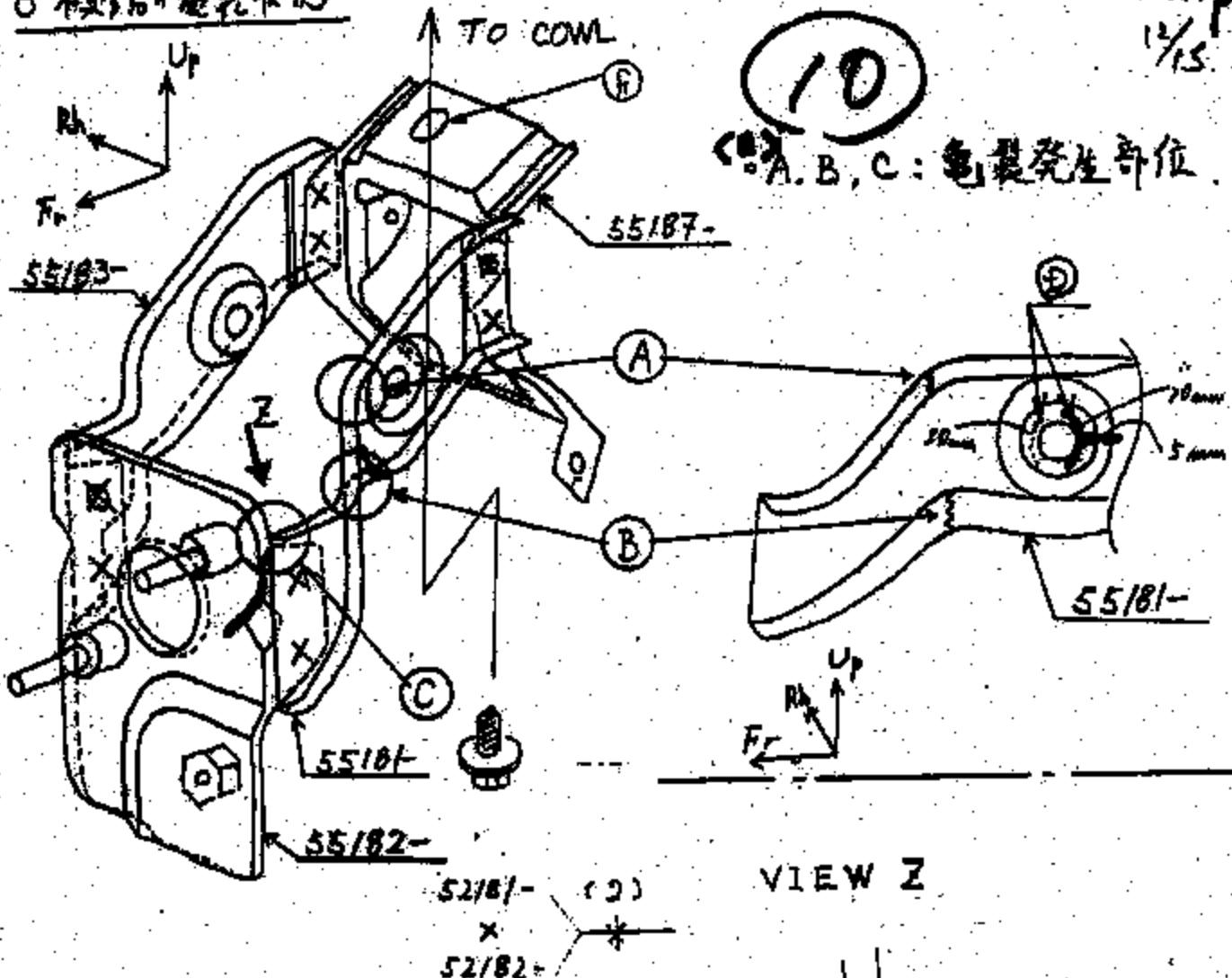
・55181 フランジ長さ: 16mm面面0.



	Ⓐ, Ⓑ	Ⓒ	Ⓓ	Ⓔ 傷れ測定結果
⑤ 図210. I	腐れ 5mm 4~5mm	10mm	20mm+20mm+5mm	腐れ大
⑥ II	5~8mm	45mm	なし(?)	調査

81年3月
1/15

○被合品・電翼状況

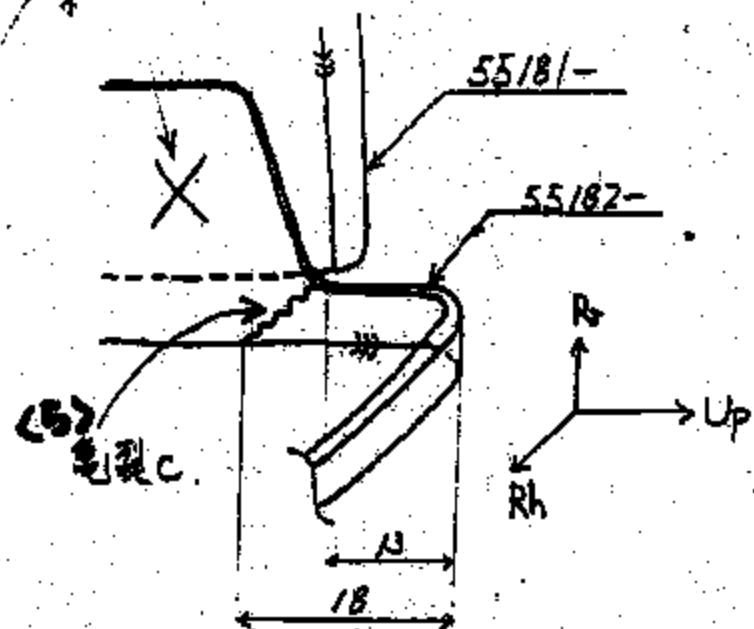


10

○A,B,C: 電翼発生部位

○(3) 回転羽根の場合の製造形狀

○(4) ○55182-について
フランジ及びコア-R
図面どおりに出来ている。
○55181 フランジ長さ; 18mmあり。
○55181 フランジ長さ; 12mmある。



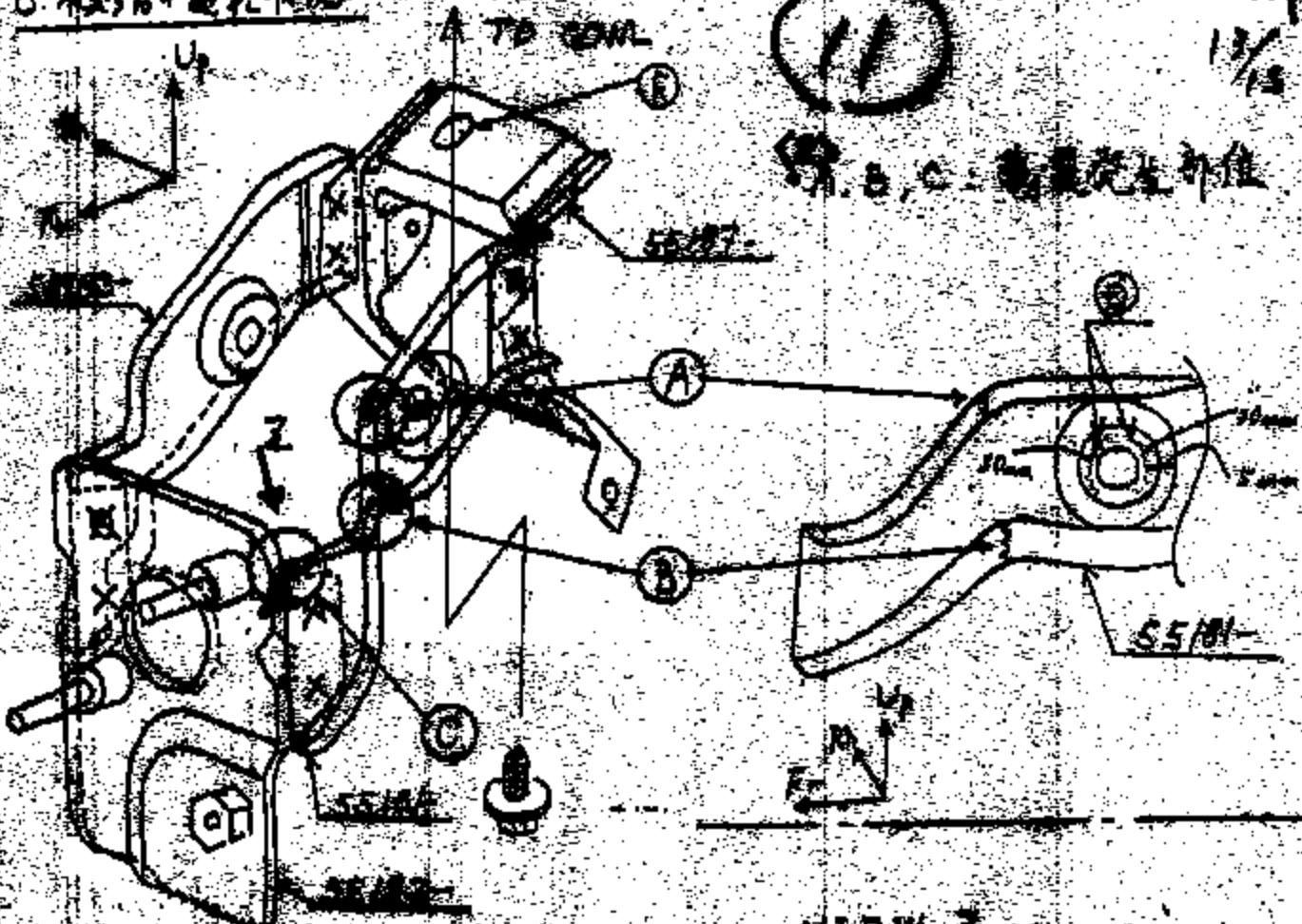
	(A), (B)	(C)	(D)	(E) 傷れ割れ等有り
○(1) L	32~47 4~5mm	10mm	20mm+20mm+5mm (中間)	○(2) 傷れ割れ等有り
+ E	5~8mm	45mm	○(3) (?)	○(4) 調査

○ 不全品・過乳状態

引機運転

1/2

A 70 mm

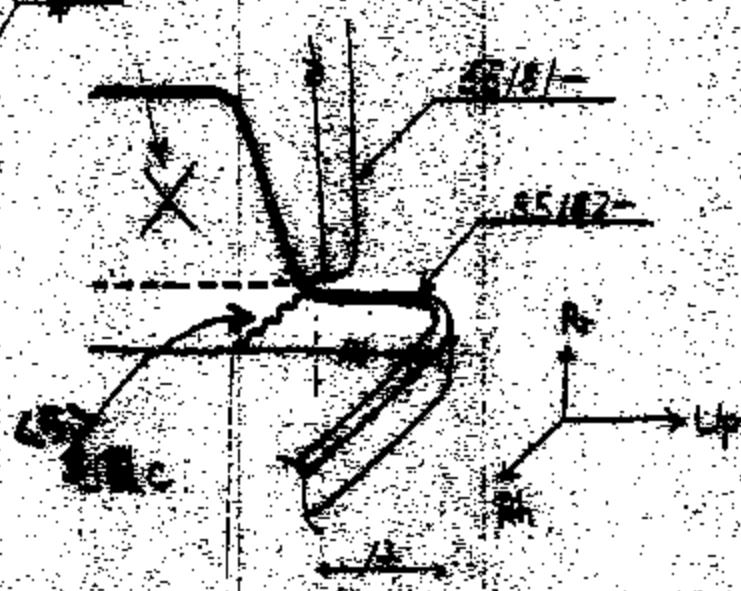


VIEW 2

SIDE - C

S5/81

S5/82



○ 不全品・過乳状態

○ 不全品・過乳状態

○ 不全品・過乳状態

○ 不全品・過乳状態

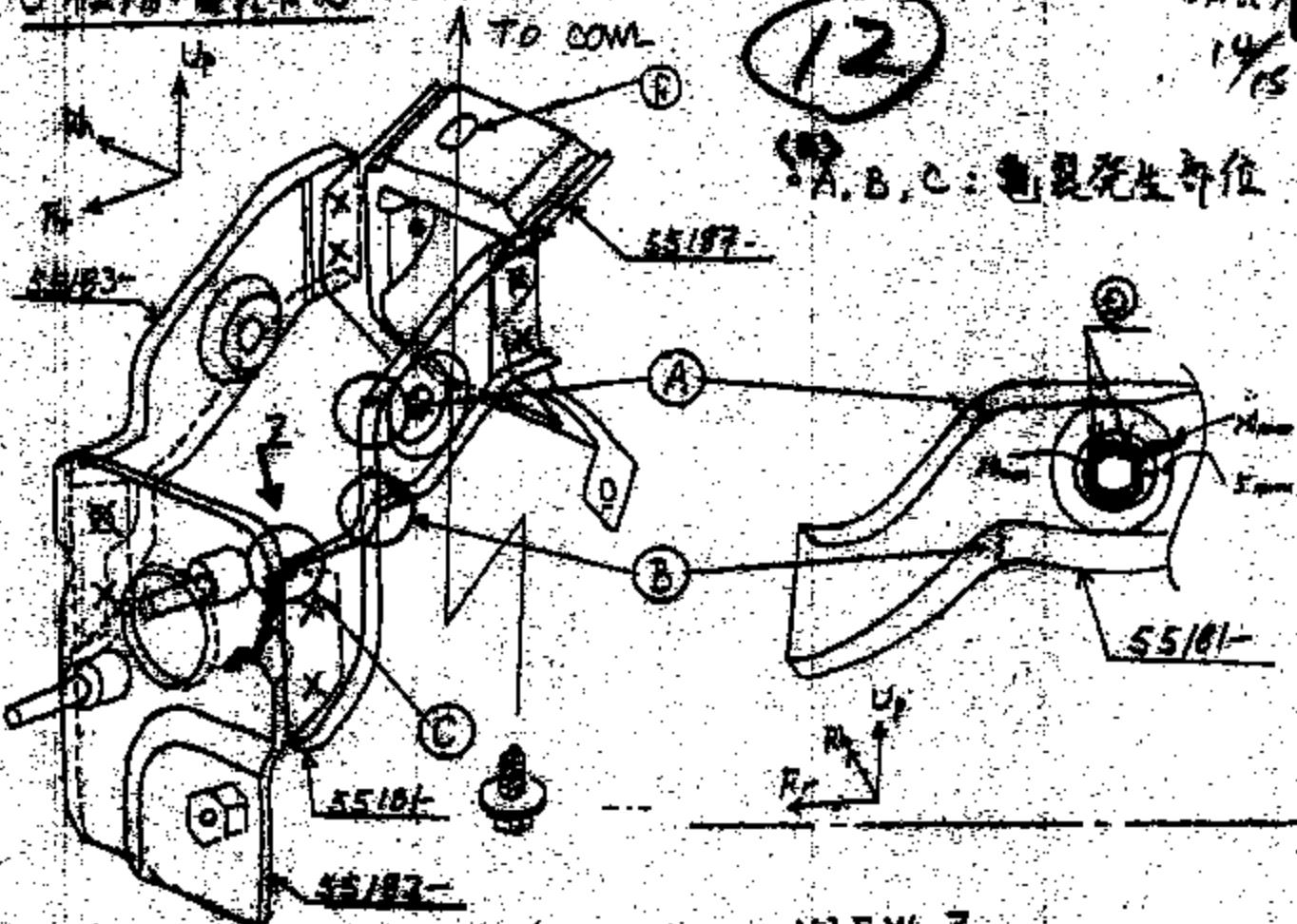
○ 不全品・過乳状態

○ 不全品・過乳状態

○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態
○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態
○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態	○ 不全品・過乳状態

○不正給油警報発生

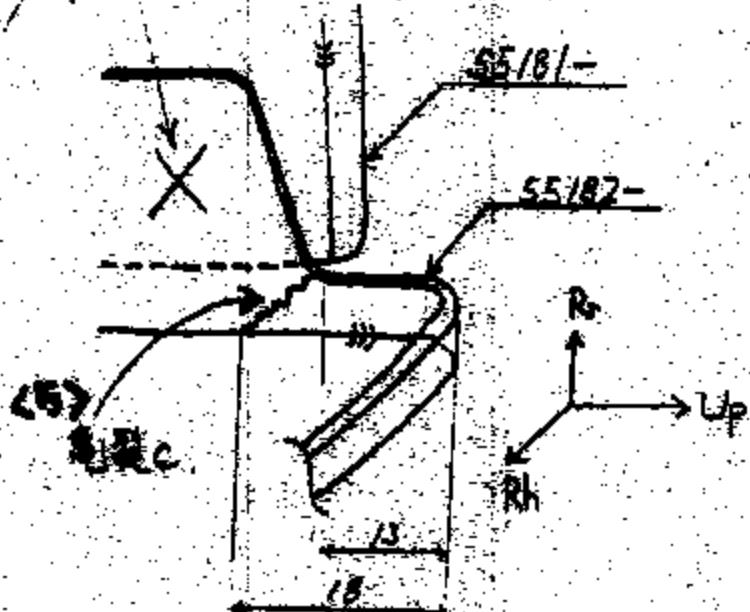
81FH3P5
14/5



VIEW Z

回転部に場合、異音発生

- 35182-について右側、
- フランジ側面コールド
- 端面であります。取扱い上、
- ・35183 7402-表記: 35183-001、
- ・35181 7402-表記: 35181-001。



①, ②	③	④	⑤	⑥
4500000000	4~5mm	10mm	20mm+30mm	序盤大
I	5~8mm	15mm	11(3)	中間2

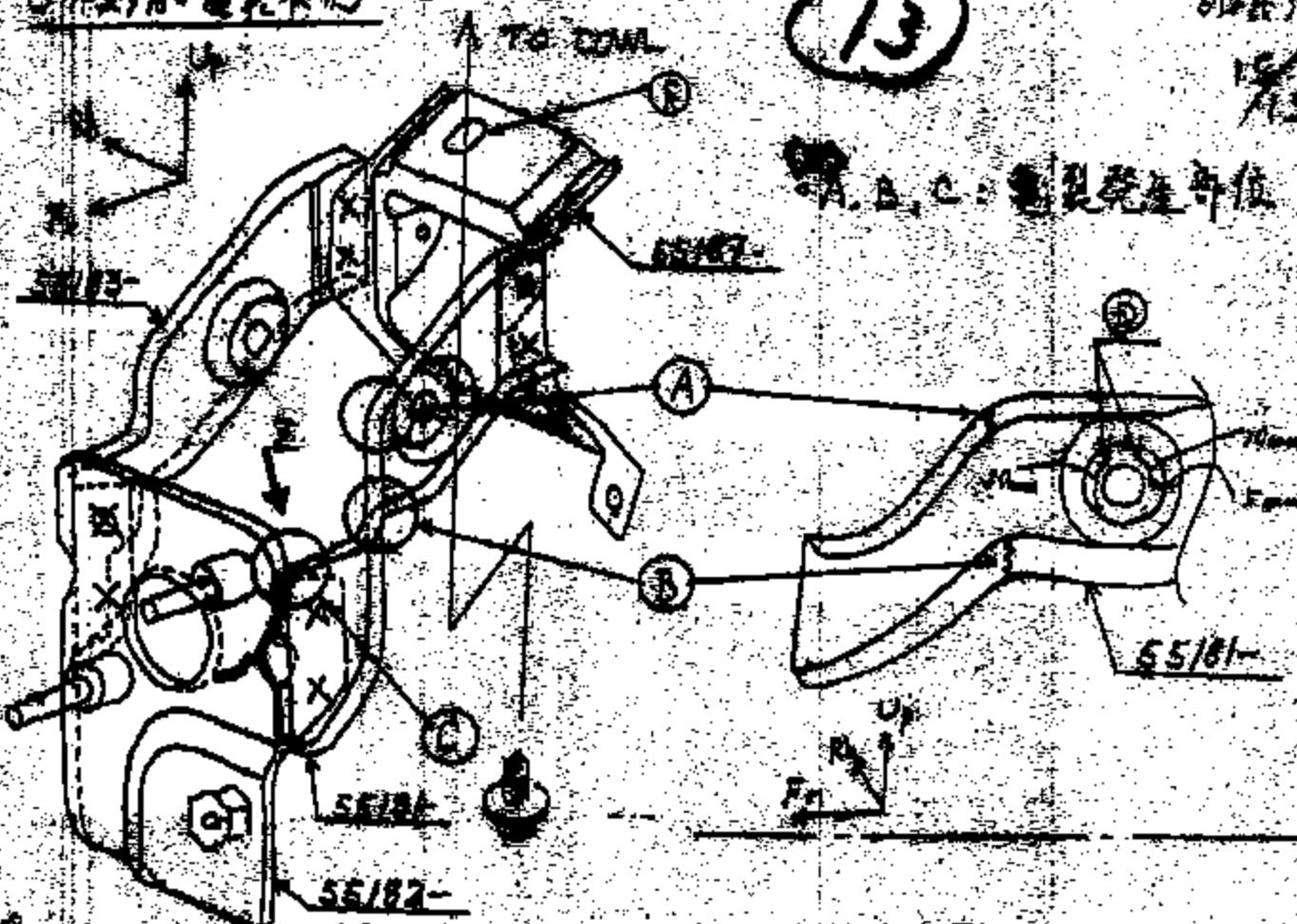
車輪・車軸

SUPER JP

13

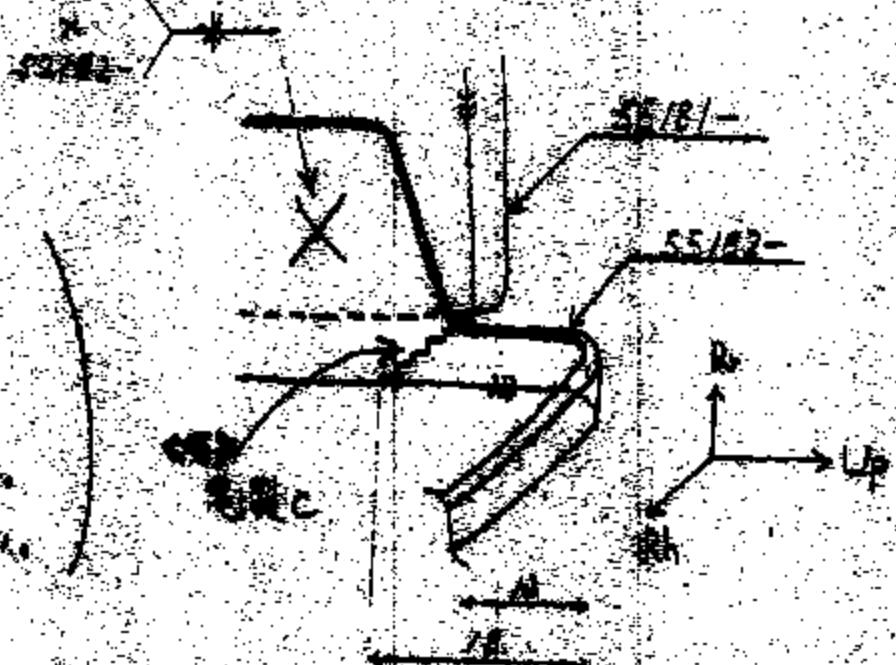
13

A,B,C: 電気発生部位



S5181-01

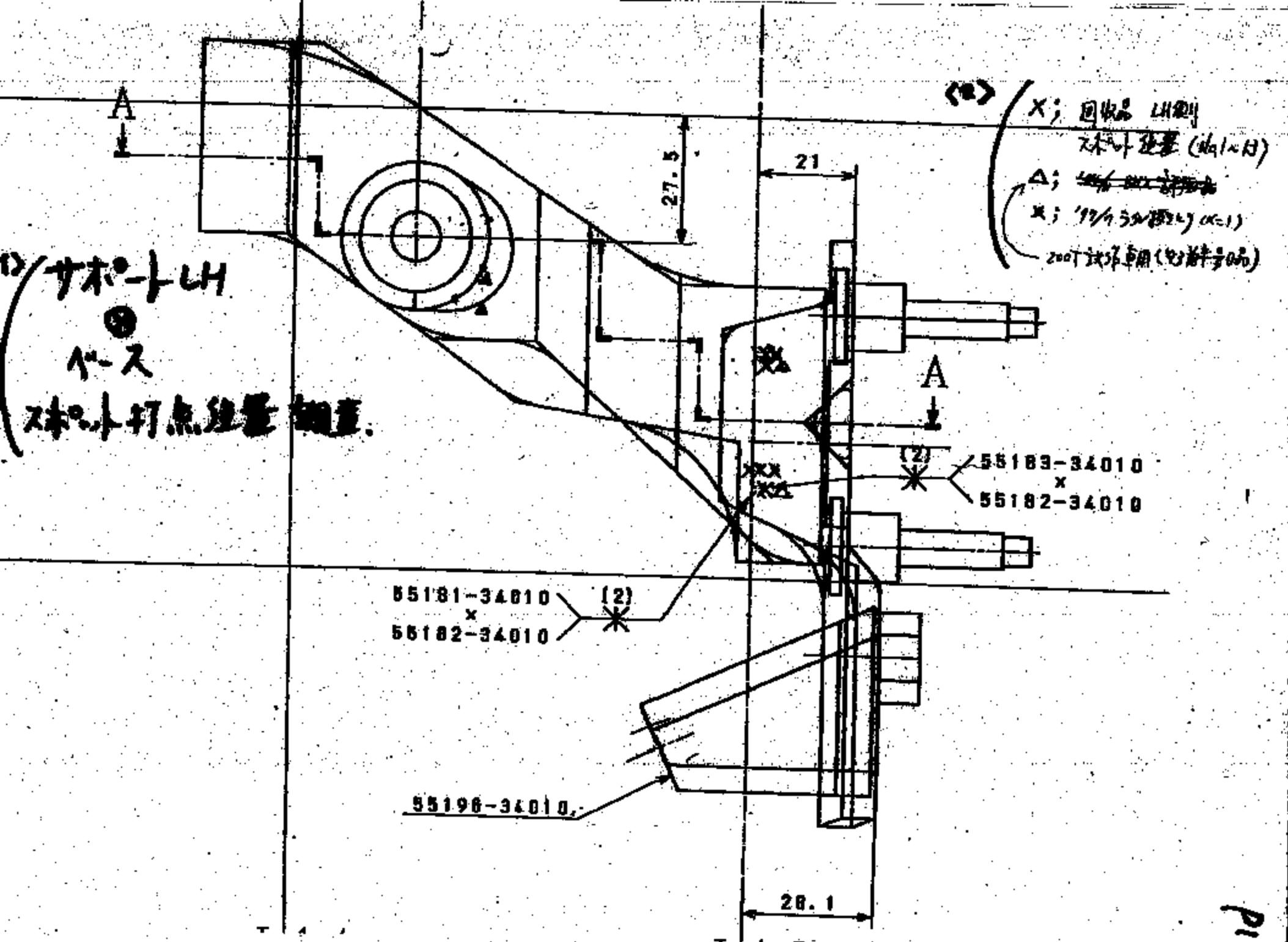
VIEW 2



(A)	(B)	(C)	(D)	(E)
-----	-----	-----	-----	-----

車輪上	車輪下	10mm	20mm+2mm±5mm	車軸外
L	5mm	mm	mm	mm

1) **ナホトヒ**
ヘア
ヌホト打点位置調整



414

**DRAWINGS AVAILABLE UPON
REQUEST**

(page 1)

- <--> Report of results of survey to determine of vehicle in accident was
driven by:
 - <--> Driver
 - <--> Survey of driver's condition at accident for evidence
 - <--> Level of intoxication
 - <--> Locomotor skills
 - <--> Cognitive skills
 - <--> Reaction time
 - <--> Visual acuity
 - <--> Locomotor skills
 - <--> Cognitive skills
 - <--> Reaction time
 - <--> Driver behaviour
- <--> Manufacturing history report and samples
- <--> In regard to the above items, the failed parts have been collected and will be following
analysis into their condition to be implemented.
- <--> Classification of results
- <--> Summary of failed parts
- <--> Classified / Unclassified
- <-->

1. Parts collected: Chevrolet truck - Appendix 18

Part No. 55307-24010

2. Description of collected parts (one off between Rev 04 and Rev 06 - 3 unclear)
Distance: 17.007 miles to 20.000 miles (20000m)

3. Results of analysis: Previous reports shown for details (Pages 1 - 10).

The following procedure was followed in inspecting the collected parts:

1. Status of cracking

All collected parts had cracks on the upper side of the front left support
attachment.

The left hand central part of the support allowed evidence to release except no.
10. Of the collected parts, some were totally ruptured. (see page no. 8, the right
hand support showed no damage).

2) Structure of cowl-side ribbed surface

In sections of the bracket cowl-side and washer side surfaces showed that almost all the ribbed pattern had disappeared.

b) Given that one oil plane showed wear in reference to the flat sections of the bracket cowl side.

← In sections of the bracket cowl side this area has been abraded so as to be approximately the same height as the flat side. It is proposed that the operation of the gear pump system is to build up on the bracket side according to condition.

**DRAWINGS AVAILABLE UPON
REQUEST**

• No associations

X1000

www.House

100

Survey of recalled and collected T100 clutch pedal brackets (outline)

THEY TOOK

No.	Frame no. (model)	L/O	Milage (miles)	Bolt dislodging: surface rob marks	Bracket seating status (see)					Note
					Cowl side	Base	Support (A)	Support (B)	Washer interference	
1	J14VD12E98 (VGK11L-CRMKA)	'93 0010004	4/27 25,848	x	o	x	x	o	o	
2	J14VD12F38 (VGK11L-CRMKA)	'93 0010036	4/12 26,402	x	o	x	x	o	x	
3	J14VD22E23 (VGK21L-CRMKA)	'93 0011700	5/13 39,836	x	o	x	x	x	x	
4	J14VD12E98 (VGK11L-CRMKA)	'94 0040881	12/13 —	x	o	x	x	o	x	
5	—	—	—	x	o	x	—	—	—	Disper- ersed for use
6	J14JM110XT (VGK10L-CRMKA)	'95 0010009	10/16 35,981	x	o	x	x	replaced	o	x
7	J14VD12E98 (VGK11L-CRMKA)	'95 0005466	1/13 —	x	o	x	x	o	x	
8	J14UN24DN (VGK21L-CRMKA)	'95 0010015	10/3 19,017	x	o	x	x	o	x	
9	J14TN14D3P (VGK11L-CRMKA)	'96 0002433	2/19 —	x	o	x	x	replaced	o	x
10	J14UN22D7T (VGK21L-CRMKA)	'95 0020039	11/11 17,287	x	o	x	x	o	x	
11	J14UN24D2J (VGK21L-CRMKA)	'95 0019461	10/30 22,361	x	o	x	x	o	x	
12	J14VD20A4P (VGK11L-CRMKA)	— 0001547	— —	— Unclear due to rust	o	x	x	o	— Unclear due to rust	Significant rusting
13	J14VD11G7 (VGK11L-CRMKA)	'95 0000224	3/13 —	x	o	x	o	o	x	Service parts

(page 4)

- <1> Status of cracking in failed parts
- <2> A, B, C: location of cracking
- <3> Shape of recalled collected parts I
- <4> The 55182 flange and corner round are as shown in the diagram.
 - 55182 flange length: as per diagram
 - 55181 flange length: 1-2mm shorter
- <5> Cracking C
- <6> Collected parts I
- <7> Cracking 4-5mm
- <8> Cowls side tightening
- <9> Wear on washer side
 - Significant wear
- <10> Needs survey
- <11> None (?)

(page 5)

- <1> Status of cracking in failed parts
- <2> A, B, C: location of cracking
- <3> Shape of recalled collected parts I
- <4> The 55182 flange and corner round are as shown in the diagram.
 - 55182 flange length: as per diagram
 - 55181 flange length: 1-2mm shorter
- <5> Cracking C
- <6> Collected parts I
- <7> Cracking 4-5mm
- <8> Cowls side tightening
- <9> Significant wear
- <10> Needs survey
- <11> None (?)

(page 6)

- <1> Status of cracking in failed parts
- <2> A, B, C: location of cracking
- <3> Shape of recalled collected parts I
- <4> The 55182 flange and corner round are as shown in the diagram.

00100 Gauge length: as per diagram

00101 Gauge length: 1.2mm diameter

<1> Cracking C

<2> Collected parts I

<3> Cracking 4-5mm

<4> Convex side flattening

<5> Significant wear

Wear on weaker-side

<10> None

<11> None (?)

(page 7)

<1> Starts of cracking in failed parts

<2> A, B, C: location of cracking

<3> Shape of cracked collected parts I

<4> The 00100 flange and corner round are as shown in the diagram.

00100 Gauge length: as per diagram

00101 Gauge length: 1.2mm diameter

<1> Cracking C

<2> Collected parts I

<3> Cracking 4-5mm

<4> Convex side flattening

<5> Significant wear

<10> None

<11> None (?)

(page 5)

<1> Starts of cracking in failed parts

<2> A, B, C: location of cracking

<3> Shape of cracked collected parts I

<4> The 00100 flange and corner round are as shown in the diagram.

00100 Gauge length: as per diagram

00101 Gauge length: 1.2mm diameter

<1> Cracking C

<2> Collected parts I

<3> Cracking 4-5mm

<1> Corral side: Right hand

<2> Significant wear

Significant wear on weaker side

<3> Needs survey

<4> None (?)

(page 9)

<1> Start of cracking in failed part

<2> A, B, C location of cracking

<3> Shape of cracked collected parts:

<4> The 2000 gauge and beyond wear are as shown in the diagram.

05/10 Gauge length: as per diagram

05/10 Gauge length: 1.4mm

<5> Cracking C

<6> Collected parts I

<7> Cracking A/B

<8> Corral side: Left hand

Weaker/weaker side

<9> Needs survey

<10> None (?)

(page 10)

<1> Start of cracking in failed part

<2> A, B, C location of cracking

<3> Shape of cracked collected parts I

<4> The 2000 gauge and beyond wear are as shown in the diagram.

05/10 Gauge length: as per diagram

05/10 Gauge length: 1.2mm

<5> Cracking C

<6> Collected parts I

<7> Cracking A/B

<8> Corral side: Left hand

Weaker/weaker side

<9> Needs survey

<10> None (?)

(page 11)

<1> Status of cracking in failed parts

<> A, B, C: location of cracking

<> Shape of recalled collected parts I

<> The 55182 flange and corner round are as shown in the diagram.

55183 flange length: as per diagram

55181 flange length: 1-2mm shorter

<> Cracking C

<> Collected parts I

<> Cracking 4-5mm

<> Cowl side tightening

<> Significant wear.

Wear on washer side

<10> Needs survey

<11> None (?)

(page 12)

<1> Status of cracking in failed parts

<> A, B, C: location of cracking

<> Shape of recalled collected parts I

<> The 55182 flange and corner round are as shown in the diagram.

55183 flange length: as per diagram

55181 flange length: 1-2mm shorter

<> Cracking C

<> Collected parts I

<> Cracking 4-5mm

<> Cowl side tightening

<> Significant wear.

<10> Needs survey

<11> None (?)

(page 13)

<1> Status of cracking in failed parts

<> A, B, C: location of cracking

<> Shape of recalled collected parts I

<> The 55182 flange and corner round are as shown in the diagram.

55188 flange length: as per diagram

55181 flange length: 1-2mm shorter

<4> Cracking C

<4> Collected parts I

<7> Cracking 4-5mm

<4> Cowl side tightening

<4> Significant wear

Wear on washer side

<10> Needs survey

<11> None (?)

(page 14)

<1> Status of cracking in failed parts

<4> A, B, C: location of cracking

<4> Shape of recalled collected parts I

<4> The 55182 flange and corner round are as shown in the diagram.

55188 flange length: as per diagram

55181 flange length: 1-2mm shorter

<4> Cracking C

<4> Collected parts I

<7> Cracking 4-5mm

<4> Cowl side tightening

<4> Significant wear

<10> Needs survey

<11> None (?)

(page 15)

<4> Status of cracking in failed parts

<4> A, B, C: location of cracking

<4> Shape of recalled collected parts I

<4> The 55182 flange and corner round are as shown in the diagram.

55188 flange length: as per diagram

55181 flange length: 1-2mm shorter

<4> Cracking C

<4> Collected parts I

<7> Cracking 4-5mm

<4> Cowl side tightening

→ Significant wear

<1> Needs survey

<1> Note (?)

(page 10)

<1> Status of cracking in filled parts

→ A, B, C location of cracking

→ Status of recalled collected parts []

<4> The 50100 Series and corner robust are as shown in the diagram.

50100 Series length: 1 page diagram

50101 Series length: 1 front sheet

<1> Oneaking C

<1> Collected parts - I

<1> Cracked - front

→ Corrosion cracking

→ Significant wear

<1> Needs survey

<1> Note (?)

(page 11)

<1> Support L/H and base spot position survey

<1> : Collected parts L/H side spot position (No. 1 to 13)

Calibration table XY line ($N = 1$)

Used in 2001 prototype (also used in early 88 module)

(page 12)

<1> Bolt 10mm / bracket right side

Thought to have caused rub marks

<1> Crack marks

(page 13)

<1> Crack marks

<1> Collected parts No. 18

~~Attachment 6-9~~

**DRAWINGS AVAILABLE UPON
REQUEST**

(page 1)

<1> Clutch pedal bracket

<2> 1) Status of failure

<3> (1) Development process

<4> Evaluation results

<5> Prototype evaluation

 TB evaluation

<6> VJ: Replacement up 8.0 → 3.4!

<7> C calc added

<8> Dark cracking failure occurred in market models

<9> TS criteria:

$$\text{Force on pedal} = (\text{Full wear force on pedal} + 160) \times 1.2 + 50\text{N} = 202\text{N}$$

N = 2 million times used, no cracking

<10> 94 Reconstruction testing - 30kg 2 million times used

 TB evaluation

 Cowl tightening was loose

 Reconstruction of failure

<11> Increased tightening torque

<12> Partially broken cracking in market models

<13> 97 Reconstruction testing

 TB evaluation

<14> (2) Comparison of reconstruction test results with collected market parts

<15> Evaluation conditions

<16> Location of failed part

<17> Force on pedal (N)

<18> Repetition (10,000 times)

<19> Torque (Nm)

<20> Fixing status

<21> Breakdown force of switch part

<22> Assembly

<23> Disassembly

<24> Prototype

<25> Yes

<26> 97 reconstruction test

<27> Picture

<28> No

- >>> Collected part
 - >>> Defects
 - >>> Defect system
- >>>(1) Collected parts do not satisfy TS criteria
- (2) There is a good correspondence between the collected parts and the corresponding test parts.
- >>> Only changes subsequent to line off
- >>> No. of failures per MO
 - >>> Input
 - ✓ Check positive force
 - ✓ Check error characteristics
 - >>> Construction
 - ✓ Badly welded construction
 - ✓ Badly positioned weld
 - ✓ Badly positioned fixture
 - >>> Process
 - ✓ Badly positioned fixture
 - ✓ Badly positioned fixture
 - >>> Material
 - ✓ Check material quality
 - ✓ Check material quality
 - >>> Design
 - ✓ Check material thickness - thickness tolerance
 - ✓ Check design
 - ✓ Check overlapping fixture
 - >>> Control measurement - fixed position - holding
 - >>> Check material thickness fixture at full width - thickness tolerance, no. of passes
 - >>> Check history unless
 - >>> Check process variable
 - ✓ Length of overlap
 - >>> Check overlapping thickness fixture - fixture fixum
 - >>> Fixture corrected
 - >>> Check material thickness - thickness tolerance fixture
 - >>> Fixture corrected
 - >>> 100% + tool protection

- <45> Process survey revealed no problems
- <46> At present, reason for loss of strength is unclear. Continued testing proposed.
 - (1) Survey of collected parts (including those with no failure) (Collection to establish period during which failure did not occur)
 - (2) Pedal x body construction survey

<48-1> 3) T100 pedal bracket cracking occurrence factors

<47> Large pedal offset

 Large support bend

 Thin sheet metal

 Dash layered bolt

<48> Significant overall twisting and deformation

<49> Base x support edge contact

 Bending force stress accumulation

<50> Support bend flange edge deformation

<51> Dash side weld bolt

 Significant stress to weld

<52> Deformation when loaded

<53> Pedal bracket compared with other models

<54> Sheet metal thickness

<55> Offset

<56> Model

<57> Base

<58> Support

<59> Pedal "A"

(page 2)

<> 4) Countermeasures and schedule

 4-1 Evaluation confirmation

<1> At time of evaluation Deformation mode

<> Support

 significantly deformed

<> Base flange L/R deformation

 (round edges)

<4> 4-2 Details of countermeasure

<4> Current formation

<4> Significant amount of bending

<4> View from side

<4> Viewed from front

<4> Countermeasure formation

<4> Flange width

<10> Smoothly

<11> Washer setting

<11-1> 4-3 Effectiveness of countermeasure

<12> Results of simulation

Countermeasure: Current distortion reduced to under 0.5, increase life of part by 10 times

<13> Comparative distortion

<14> Evaluation

<15> Washer added

<16> Collar added

<17> Distortion mode

<18> Distortion control

<19> Horizontal cross section

(displacement: 50 times)

<19-1> 4-4 Evaluation schedule and date for changeover

<20> Interim countermeasure

<21> Increase in base sheet metal thickness ($t_{1.3} - t_{1.4}$)

<22> Cowl tightening torque (grade 8 - grade 2)

<23> Secure turnover bracket flat surface

<24> 5th change spec / 17th implement

<25> 5th change spec and implement

<26> 6th implement

<27> Durability countermeasure

<28> Support formation smoother / flange longer

Sheet metal thickness increased ($t_{1.4} - t_{1.6}$)

<29> Base flange lengthening / addition of collar

<30> R/F added to dash side

<31> Washed added to pedal attachment bolt

<32> Prototype: 90th change spec

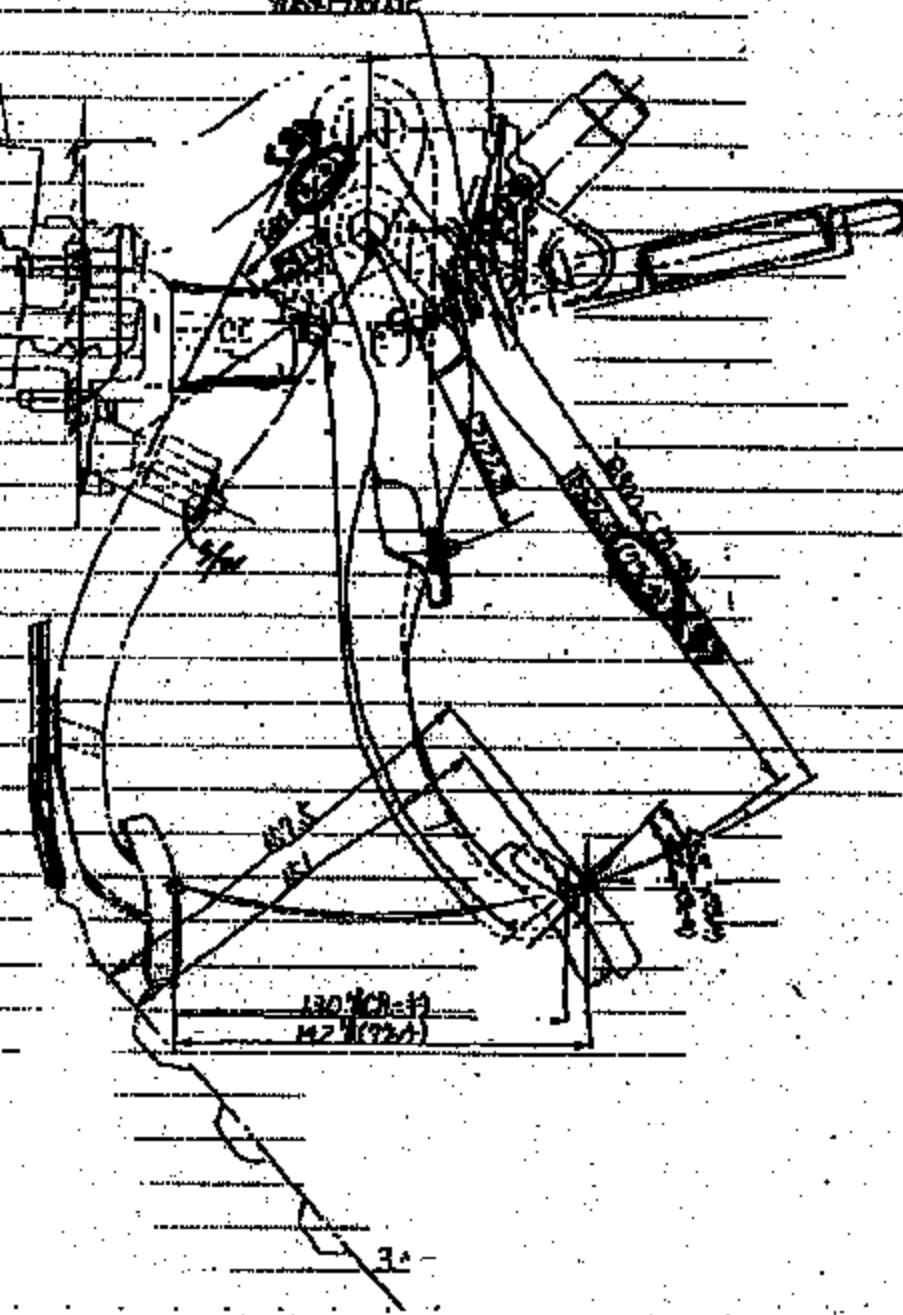
- <46> Current model parts
- <47> 20% prototype completed
- <48> Evaluation
- <49> Late September
- <50> Special designation
- <51> Start to left
- <52> Changeover from 6th October onwards
- <53> Changeover in late October
- <54> Change specifications
- <55> (Collar added)
- <56> Meeting to discuss start and changeover dates
- <57> Changeover in late December
- <58> Mid December: changeover at Miyakoyo Industrial
- 27th January: changeover at Tepro
- End January: changeover at Matsusura line
- <59> June
- <60> July
- <61> August
- <62> September
- <63> October
- <64> November

██████████

**DRAWINGS AVAILABLE UPON
REQUEST**

19700 改装件 M4 单兵携行量検定

90151-06032



774kgの荷物の重さの検定

$$P \cdot (F_1 + F_2) \times 1.2 + F_3$$

F1: 重りの重さ

F2: 初期荷物の重さ

F3: 24kgの荷物を手に取る重量

$$\therefore F_3 = 53$$

$$P \cdot (F_1 + F_2) \times 1.2 + 5$$



4x2 STD

9/9.10 生産

40153, 39-00

E7

63

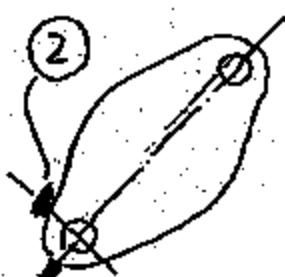
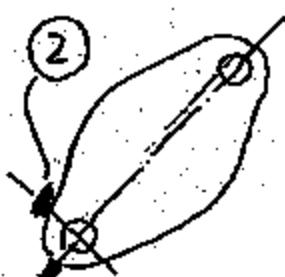
(A)

<1>

車道

<2>

T100 電子制御
(ECU A2P-1)



①

1000A

②

1000A

<3>
踏力

100N

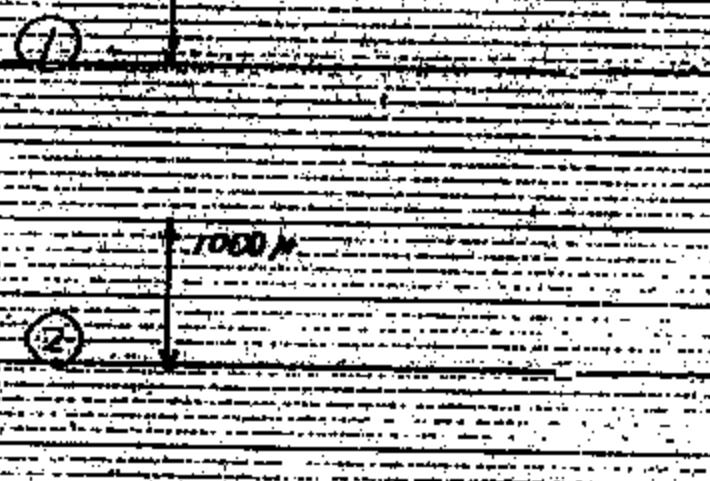
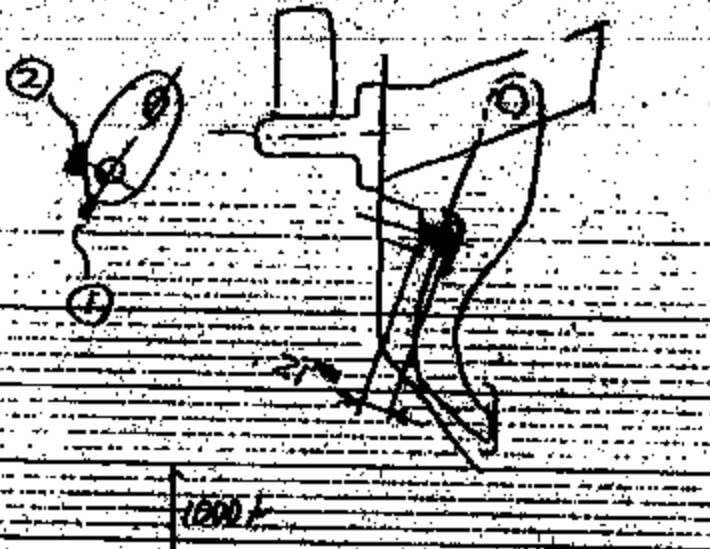
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車道

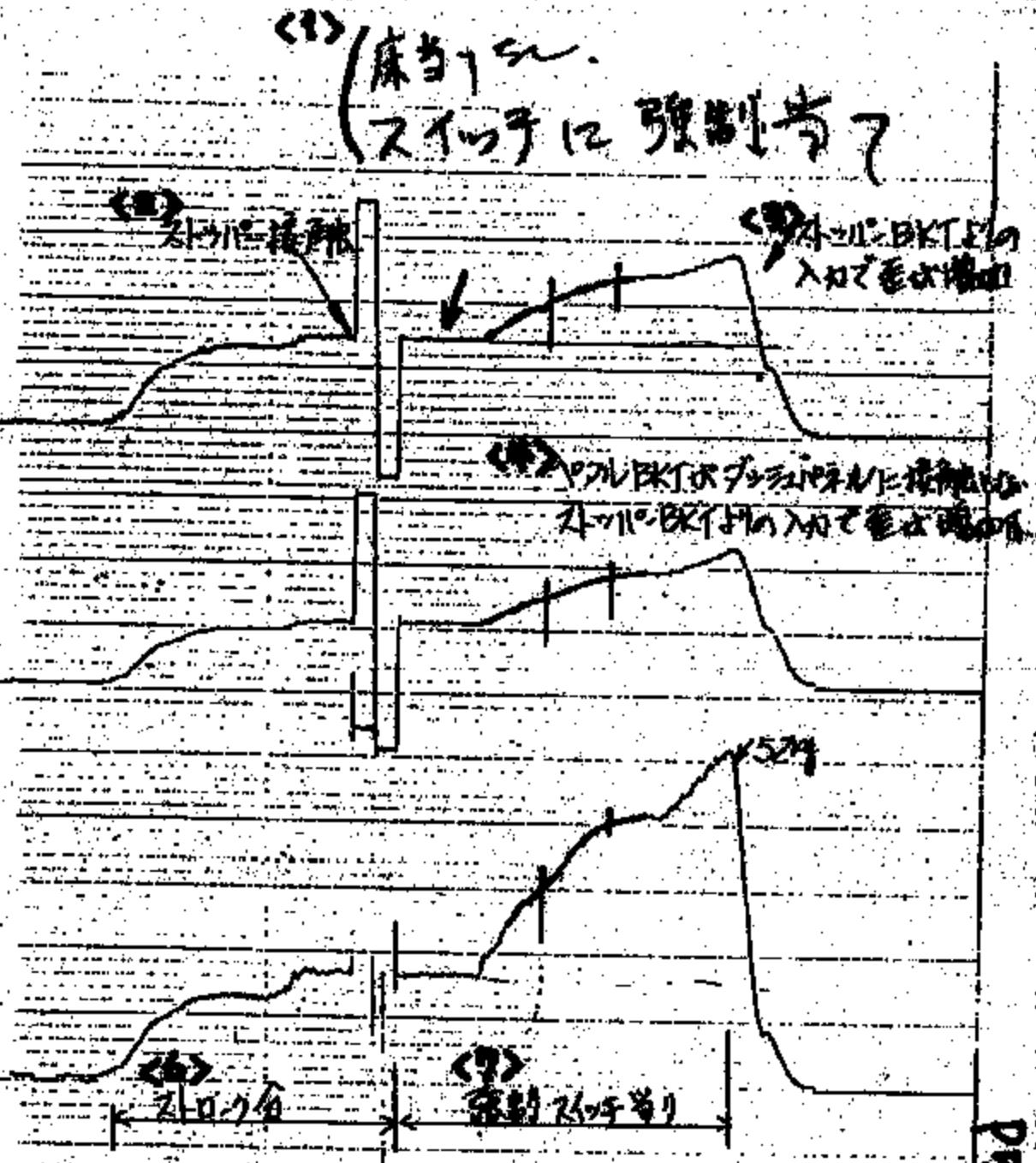
カーバウトリム

<2>

通常のストップ機能では
2つの止車距離を同時に
にゲージパネルにも表示す
る。左は正面撞撃距離



電流 1000A



高化水系水文資料
(210-7838812-7)

6000

5000

4000

3000

2000

1000

TS 捕魚場

漁業場

(210-78)

10

20

30

20

水深 H (m)

1000 1500 2000 2500 3000 3500

米

2500 2000 1500 1000 500

米

2000 1500 1000 500

米

1500 1000 500

米

1000 500

米

500

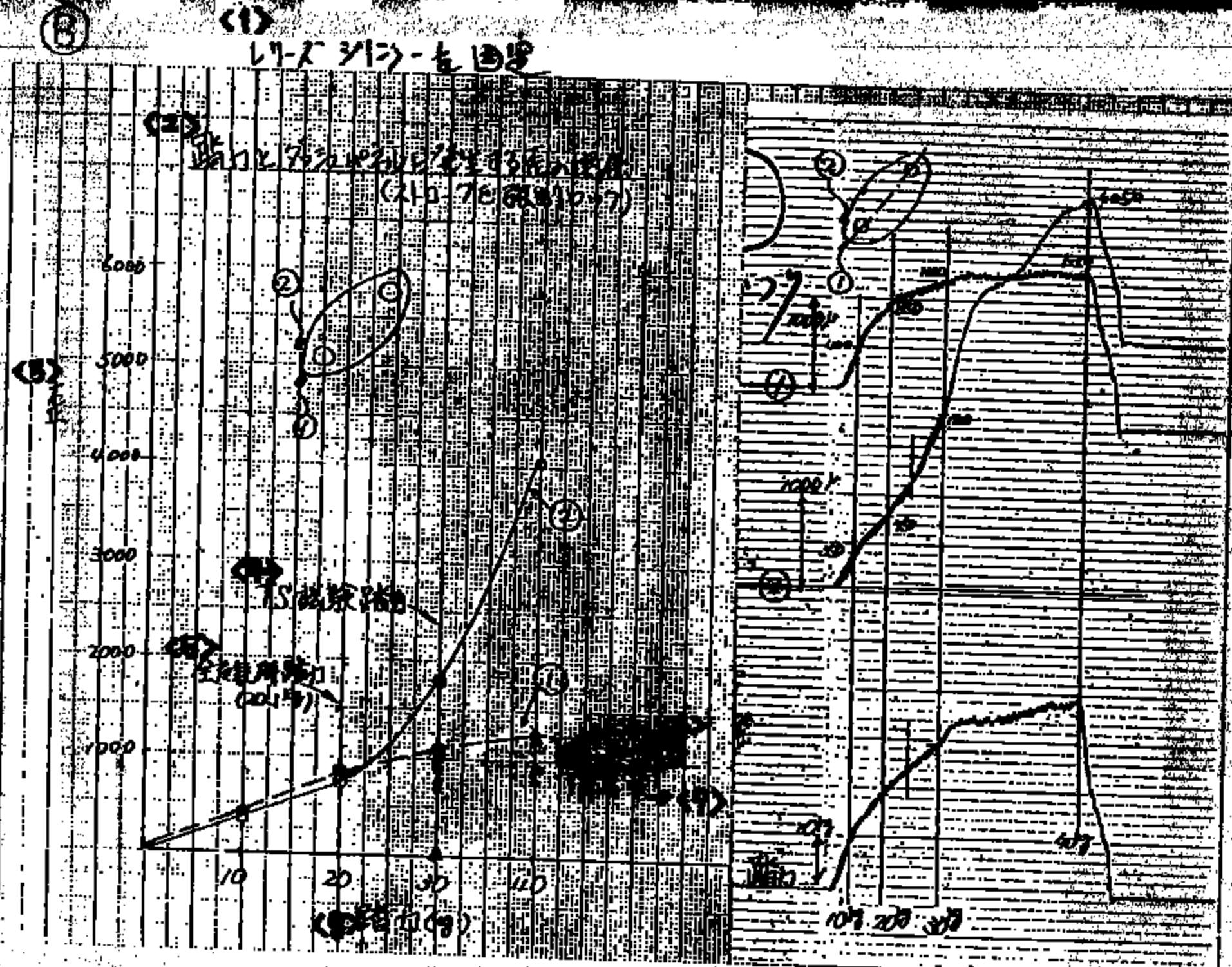
米

0

米

100 200 300

26



Group 13

Background to the development of the P70B Glauber's Soda Process

1) Research and development

(a) Novelty and novelty of the process

- <Chemical reaction>
- <Process and reactor>
- <Industrial synthesis>
- <Alkaline salts>
- <Process>
- <Process>

(b) Novelty of the product

Two-step process - crystallization at 30°C and 50°C (two-stage crystallization technology)

Second step product - Polystyrene

Third-step product (final product) - Tapered or tapered morphology ($N = 1.1$ million times used, breaking strength: 35

Third-step product: 2 million times used (tapered crystallizing times ratio: 1.0) - no problems seen

(\rightarrow no problems seen)

<Chemical reaction>

<Crystallizing times after 1.1 million times used > causes the Glauber formation, no problems

<Crystallizing occurs after 1.1 million times used

<Industrial synthesis times width from 500 to 5000

<Process times width from 310,000 to 3,000,000

<Process times width from 500,000 to 5,000,000 times used

<Process times width>

<Chemical reaction / novel crystallization>

<Chemical reaction / novel crystallization> - that is not found in P70A

<Process times width>

<Process times width>

<Chemical reaction / novel crystallization>

(c) Downstream processing conditions

Force on pedal = 30kg

P (force on pedal) = (dispersion of force on fully worn pedal + initial force on pedal)
x 1.2 + increase in clutch (with stopper) power input

- <20> Engine: 21, EFI fitted
- <21> 640T reactive force, max B/G: 3RZ-FE 20kg
- <22> Outline of testing apparatus
- <23> Coil spring
- <24> (Keeps coils firmly in place during stroke)
- <25> Clutch cylinder
- <26> Load cell
- <27> Air cylinder
- <28> Endurable frequency: 0.35Hz (15 times / minute)

(page 2)

Cracking in dash panel of T100 Clutch Pedal Bracket attachment

1. Relationship between force on clutch pedal and distortion of dash panel

(1) Normal circumstances

- <1> Location of part measured for distortion
- <2> Force on pedal
- <3> Contact with floor
- <4> Carpets
- <5> Stroke
- <6> Contact with stopper
- <7> Normal usage
- <8> Stroke
- <9> Stopper contact force

(2) When the stopper is not touched (power input by master cylinder only)

Measurements taken with release cylinder in locked position.

- <10> Relationship between force on pedal and distortion occurring to dash panel (with stroke forcibly locked)
- <11> Distortion
- <12> TS experimental force on pedal
- <13> Force on pedal at full wear

2. Confirmation of dashboard cracking limit (reconstruction experiment)

(1) 0 <-> 25Kgf 2 million times used, no cracking

(2) 0 <-> 30Kgf Currently testing (2 million times used: OK (some deformation))

Test to establish point at which cracking occurs

3. Future schedule

- (1) Inference of damage mechanism
- (2) Survey of damaged parts
 - details of cracking
 - deformation of dashboard
 - dimensions of parts related to attachment of master cylinder

- force on pedal
- condition of release cylinder

- A. During stroke, force on pedal is 10Kg
- B. Pedal travel: floor at almost same time as touching the stopper (switch)
Load on support approx. 1Kg
- C. Distortion is not much particularly greater by pushing off
Crushing does not occur as a result of maximum force generated

Reference: Increase in distortion when supported by stopper

- <14> Interference:
 - <15> Power to touch switch (floor and break floor)
 - <16> Contact with stopper
 - <17> Power input from stopper bracket gives increased distortion
 - <18> Mount bracket does not connect to contact with dash panel. The distortion from stopper bracket gives input is increased.
 - <19> Power to touch switch
- A. Distortion increases as travel increases in force on pedal due to load on floor
 - B. When fully loaded, $10.0 \text{Kg} + 1.5 \text{ (distortion)} = 20 \text{Kg}$
Equivalent to 50Kg in normal condition
 - C. Plastic deformation occurs at over 15kgf on pedal (durability conditions satisfied)
Possibility that damage occurs as result of excess of force on pedal due to failure of release cylinder (durability or breaking conditions)

Reference: Assumed force on pedal used to determine durability during development

- <20> Durability

(page 3)

- <1> 970D Second stage prototype manual transmission vehicle pedal assembly diagram
- <> Brake
- <> Clutch

Method of determining force on pedal for clutch pedal handling durability

$$P = (F_1 + F_2) \times 1.3$$

safety factor + PS

F1: Force on pedal when fully worn

F2: Disengagement of initial force on pedal

PS: Increase in power input by clutch with stopper

$$PS = 5\text{kg}$$

$$P_{\text{des}} = (F_1 + 1.5) \times 1.3 + 5$$

Cracking

4x2 970D

Production models from Sept / Oct 1988

40150 / 60,000 km

(page 4)

- <1> Floor contact
- <1> T160 model retained for quality assurance purposes (tolerance: 150mm)
- <1> Force on pedal
- <1> Carpeting
- <1> Stroke
- <1> Stopper contact
- <1> Normal conditions
- <1> Durability
- <1> Stroke
- <1> Stopper system pressure
- <1> Under normal conditions, when the pedal comes into contact with the stopper, it also comes into contact with the dead pedal. As a result, the distortion does not increase significantly.

(page 6)

- <--> Pressed to touch switch (down not touch floor)
- <--> Contact with stopper
- <--> Power input from stopper increases gives increased distortion
- <--> If pedal bracket does not come into contact with dash panel, the distortion from stopper bracket power input is increased.
- <--> Force on pedal
- <--> Steering
- <--> Pressed to touch switch

(page 6)

- <--> Relationship between distortion to dash panel and force on pedal (with engine flexible)
- <--> T3 experimental force on pedal
- <--> Force on fully worn pedal (0.3 kN)
- <--> Force on pedal
- <--> Distortion

(page 7)

- <--> Relocate cylinder bracket
- <--> Relationship between distortion to dash panel and force on pedal (with engine flexible)
- <--> Distortion
- <--> T3 experimental force on pedal
- <--> Force on fully worn pedal (0.3 kN)
- <--> Contact with stopper
- <--> Contact with floor
- <--> Force on pedal

Attachment 6-11

**DRAWINGS AVAILABLE UPON
REQUEST**

(page 1)

Cracking in the T100 clutch pedal bracket attachment dash panel (S)

<1> Results of reconstruction experiments

<2> Item confirmed

<3> Result

<4> Continuum

<5> Fatigue testing

<6> Executive force on pedal

<7> Force on pedal: 25kg - no cracking

Force on pedal: 30kg - no cracking

Force on pedal: 35kg - no cracking (N=2)

Bracket damaged

<8> Dash panel > Clutch bracket

<9> Cowl inner belt loosened

<10> Force on pedal: 15kg - Dash panel cracks at N = 500,000 times used

<11> Cracking

<12> At clutch usage frequency of 13-times / km (representative for TMC), almost identical
with cracking in models in general use at 40,000km

<13> Force level difference in dash panel

<14> Distortion at tightening: 0.75 μ

Force on pedal 15kg: durability - no cracking after 2 million times used

<15> (3) Strength of static damage

<16> Executive force on pedal

<17> Force on pedal 150kg deformed but no cracking

<18> (3) Confirmation of switch operation

<19> Bolt

<20> Fixed

<21> Not fixed

<22> Dash

<23> Net cracked

<24> cracked

<25> O: Switch operated

X: Switch not operated

<26> Dash panel cracking (with cowl inner clamp bolt)

<27> Force on pedal: 15kg, 20kg - switch operates

Pedal pressed until contact with dash panel

Switch operates

- <38> So long as no cracking occurs, the switch can be operated even if the cowl inner bolt comes loose.
- <39> No cowl inner bolt
 - (no dash panel cracking)
 - (Actual vehicle)
- <40> Force on pedal: 12kg - switch operates
 - Pedal pressed until contact with dash panel
 - Switch operates
- <41> No cowl inner bolt
 - dash panel cracking
- <42> Force on pedal: 12kg - switch operates
 - Pedal pressed until contact with dash panel
 - Switch does not operate
 - Subsequently, pedal pushed once again at force 12kg: does not operate.
 - Force on pedal: 20kg - switch does not operate.
- <43> Cowl inner x clutch bracket bolt not sufficiently tightened, plus occurrence of dash cracking, leads to non-operation of switch
- <44> (4) Cowl inner bolt tightening torque
- <45> Clutch bracket
 - Cowl inner bolt hole not precise enough
- <46> (1) Current line part: torque 20kg / cm or less
- <47> (2) Line off initial part: torque 30kg / cm (insert 2mm space on dash panel side of clutch cylinder bolt)
- <48> Worst case scenario test
- <49> (3) Pedal bracket precision failure: torque currently under test
- <50> Inference of damage mechanism
- <51> (1) Dash board dimensions failure (2mm level difference)
- <52> Cowl inner x clutch pedal bracket clamp bolt slip
- <53> Increase torque
- <54> Instrument panel x clutch pedal bracket insufficient bolt tightening
- <55> Loosening or gap occurs
- <56> Repeated use of clutch pedal
- <57> Dash panel cracking
- <58> Switch operation failure

~~Document 12~~

T100 クラ・チペタル 撮品 -1



<1>
T100 クラッチャーブル 壊島-1



<2>
魔器



<3>
壊島-1は銀色
の魔器を発見した
ので
魔器は魔物化



<4>

P

T100.7スチペタル 摘品-1

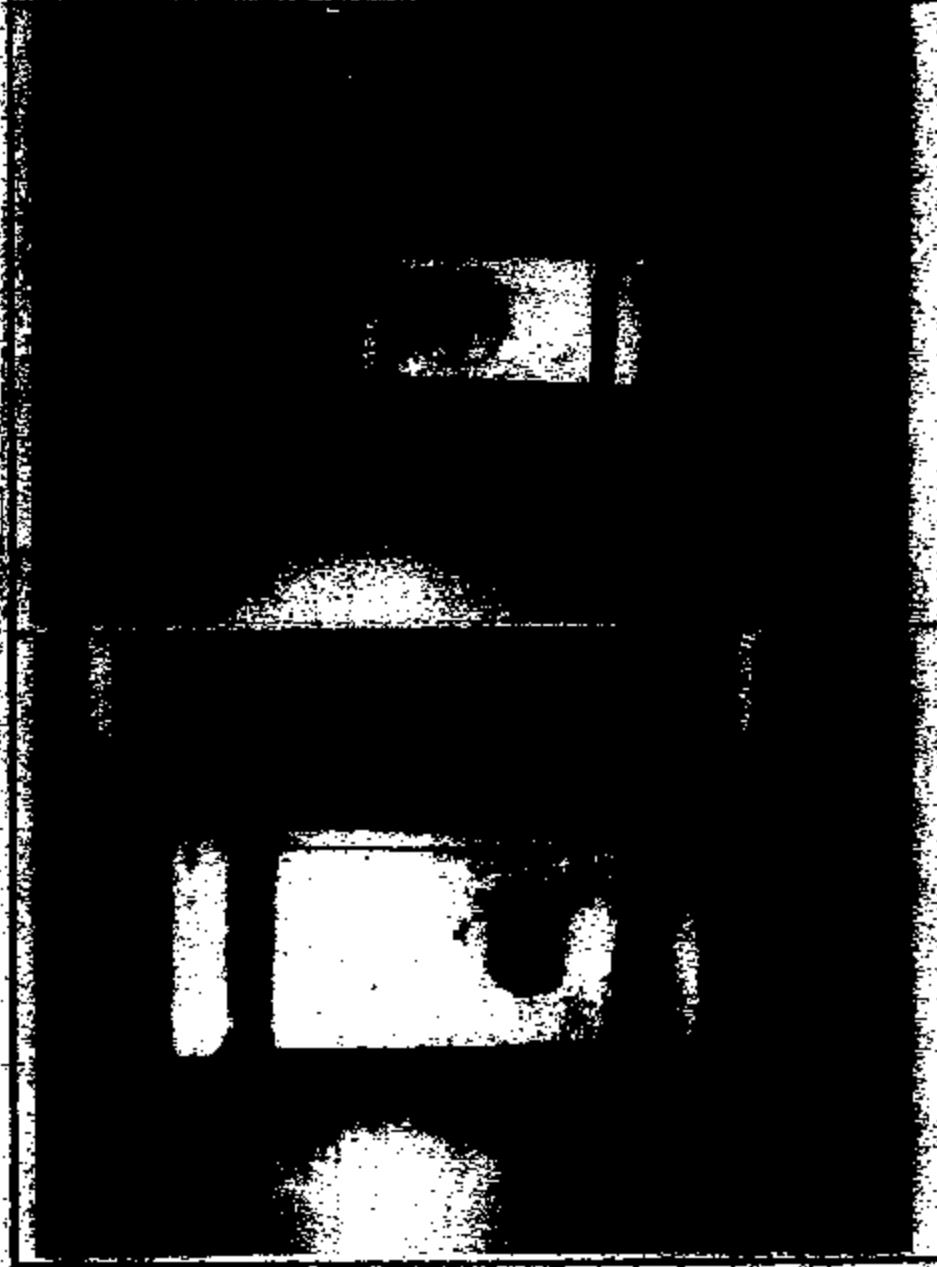


P4

T100 クラッチャクルノコロ-1



TEPPA フラットハンドル行 -1



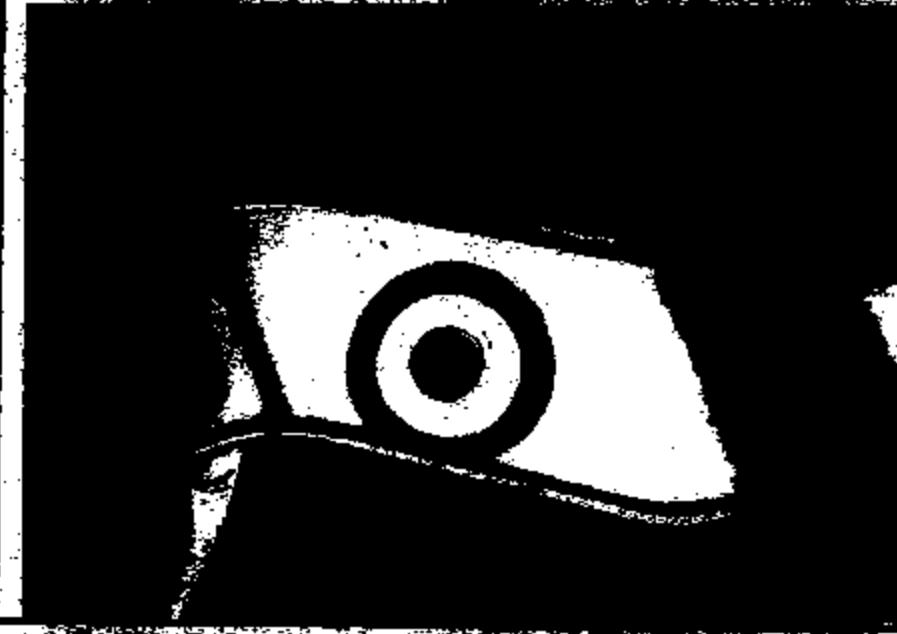
100% FASAL 100% - 2

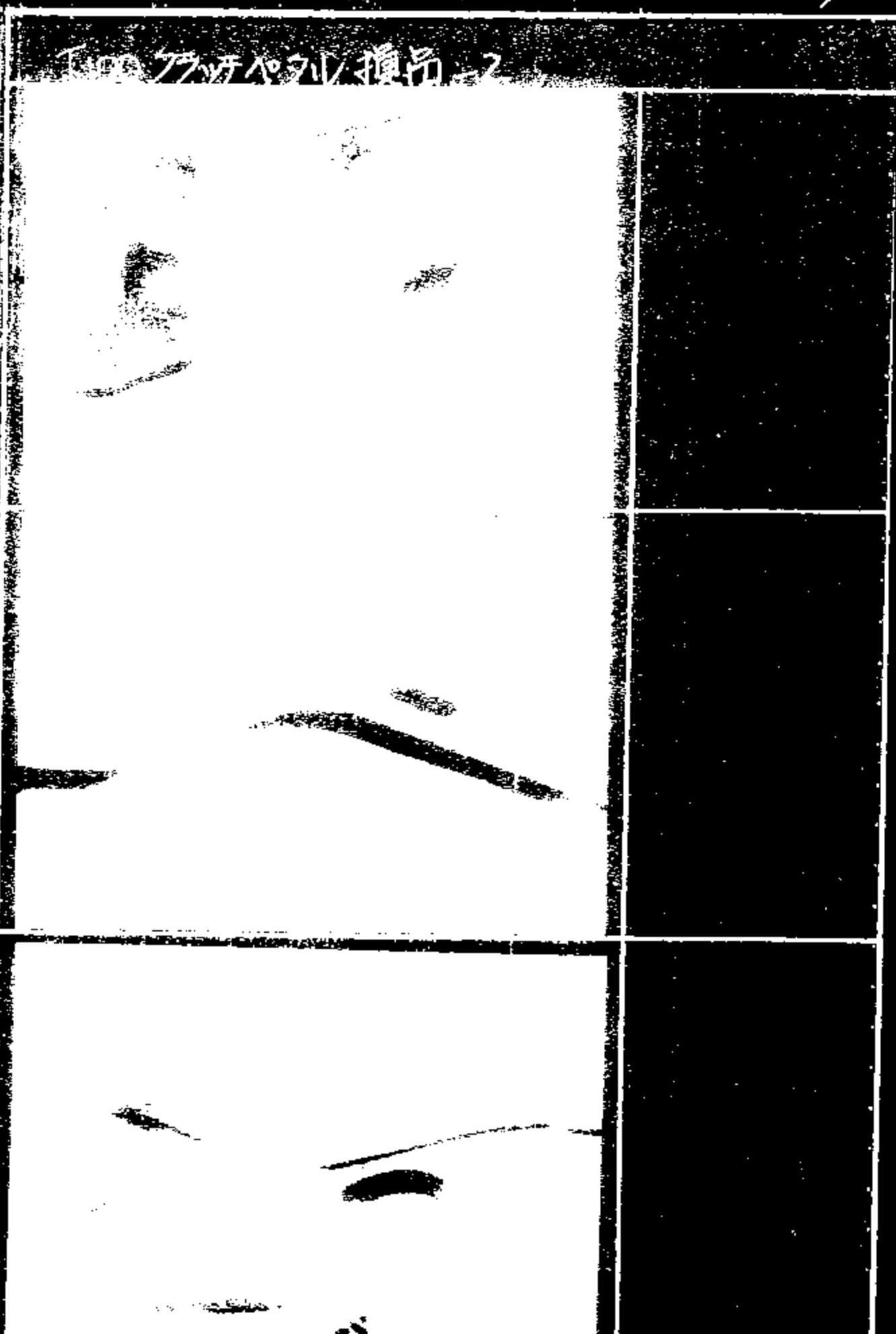


T100 クラッチャーフィル 損傷-2



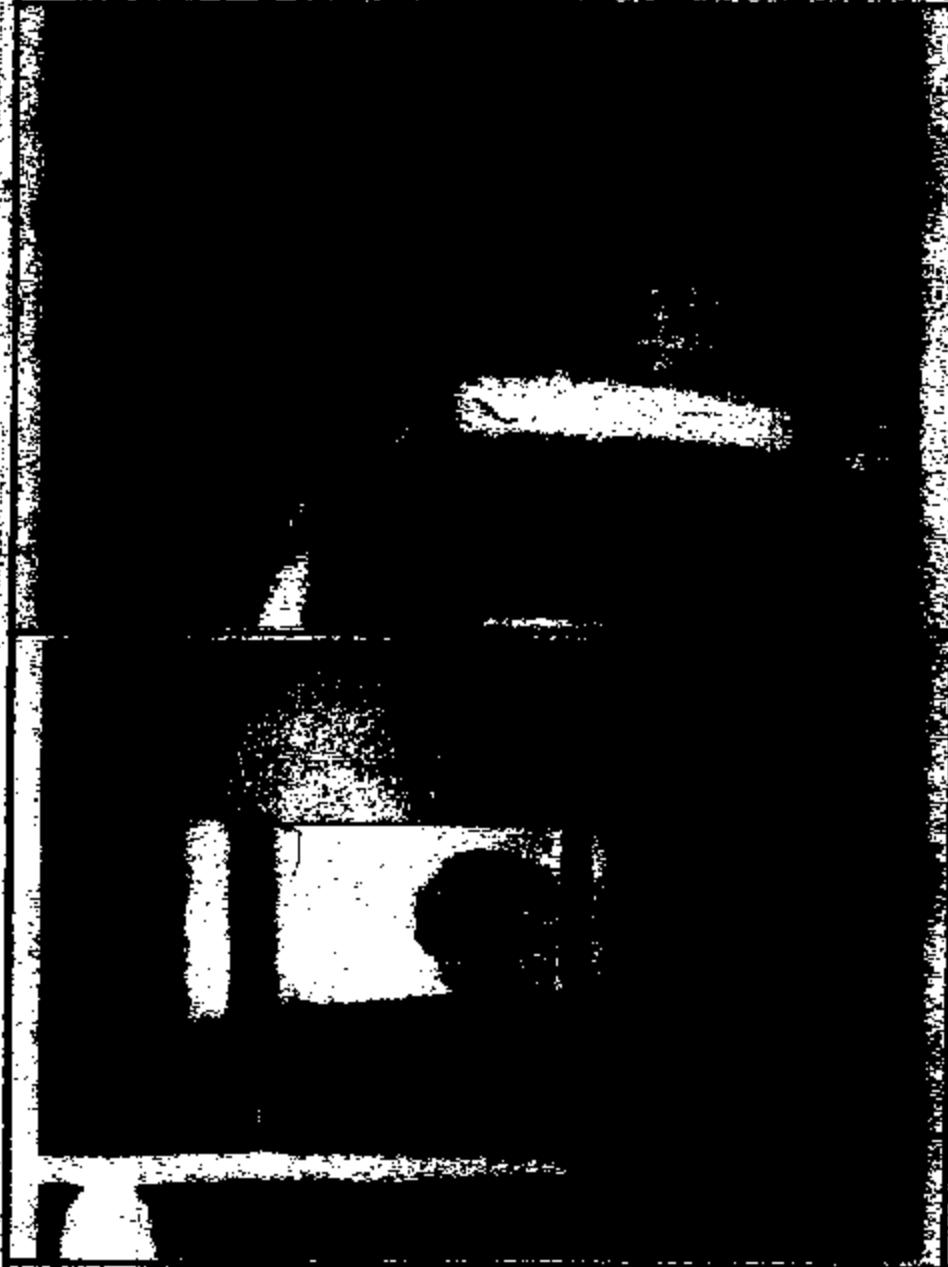
T100 73V8102L 機場-2



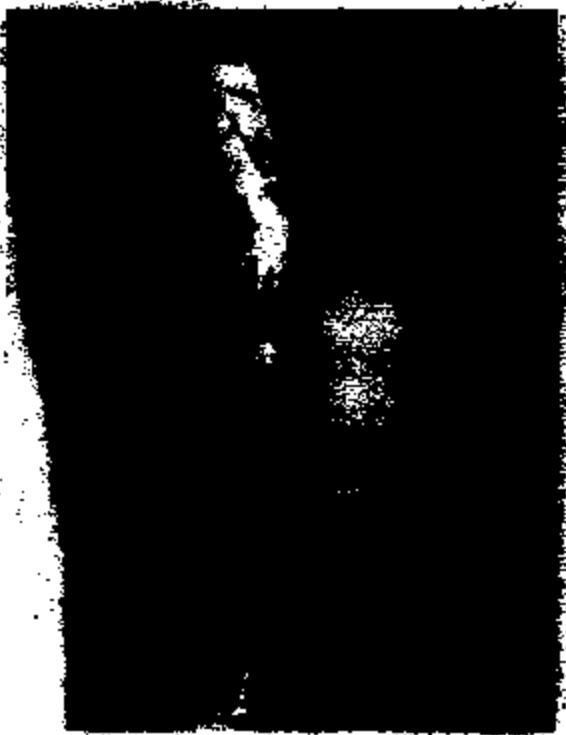


PIC

10075-71054-003->



POL



(page 1)

Damaged T100 clutch pedal - 1

(page 2)

<1> Damaged T100 clutch pedal - 1

<>> Cracking

<>> Damaged part 2 shows cracking in this area, but this part has no cracking

<>> Cracking on damaged part 2

(page 3)

Damaged T100 clutch pedal - 1

(page 4)

Damaged T100 clutch pedal - 1

(page 5)

Damaged T100 clutch pedal - 1

(page 6)

Damaged T100 clutch pedal - 2

(page 7)

Damaged T100 clutch pedal - 2

(page 8)

Damaged T100 clutch pedal - 2

(page 9)

Damaged T100 clutch pedal - 2

(page 10)

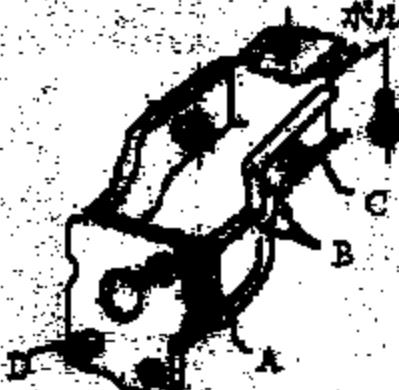
Damaged T100 clutch pedal - 2

~~Annexure 6-13~~

日本精工
ボダージャン 製部 鋼管
告文

ボルト

T100ペダルプラケット対策



1) 寿命テスト

カウル側取付ボルト締みの影響

(操作要領)

操作要領	正規 (T=15kgf·cm)	過剰締み
締め	15kgf	25kgf
A	○	✗ (32万回)
B	○	○
C	○	✗ (32万回)
D	✗ (200万回)	✗ (32万回)
		✗ (30万回)

(応力測定)

操作要領	正規 (T=15kgf·cm)	過剰締み
締め	15kgf	25kgf
A	1500/1000	2025
B	2100/1400	3830
C	(130)/200	(400)
D	1100/430	1280
		(600)

(結論)

発熱の原因：カウル側取付部の締みが主原因であり、締むと寿命が1/7に低下する。

斜め締みは影響ない。

2) 対策検討 (CAE解析)

ID部位	オリジナル	現行対策	44小判断
A	1	0.5	○
B	1		
C	1	0.64	×
D	1	0.65	○

(4) 操作耐久で最適化

3) 対策実施

(1) カウル部遮音材部の断熱塗装上

...3 / 3

(2) ブラケットのベース板厚アップ (1.2→1.4mm)

...3 / 3

(3) サポートの形状変更

...3 / 3

以上

Chapter 1:

T/OC pedal boarder constraints

• Pedal board

1) Recreational use

Effect of seat height on seat attachment bolt

Chair height (mm)

• Chair height

• Front position

• Normal (T = 1.00 mm)

• Low position

(0.60 mm) (mean value)

(0.60 mm) (mean value)

(0.60 mm) (mean value)

Chair height (mm)

• Normal pressure / critical pressure (at approx. 10°)

Conclusion:

Source of constraint: Main origin is tension in the seat attachment.

Lumbar pressure is

independent of 10% of the operating life.

Higher pressure of the pedestal has no effect.

Chapter 2:

2) Results of greater pressure (G/H analysis)

• Back position

• Chair height

• Chair height (mm)

• Result

• Visual distinction based on operating flexibility

8) Countermeasures taken

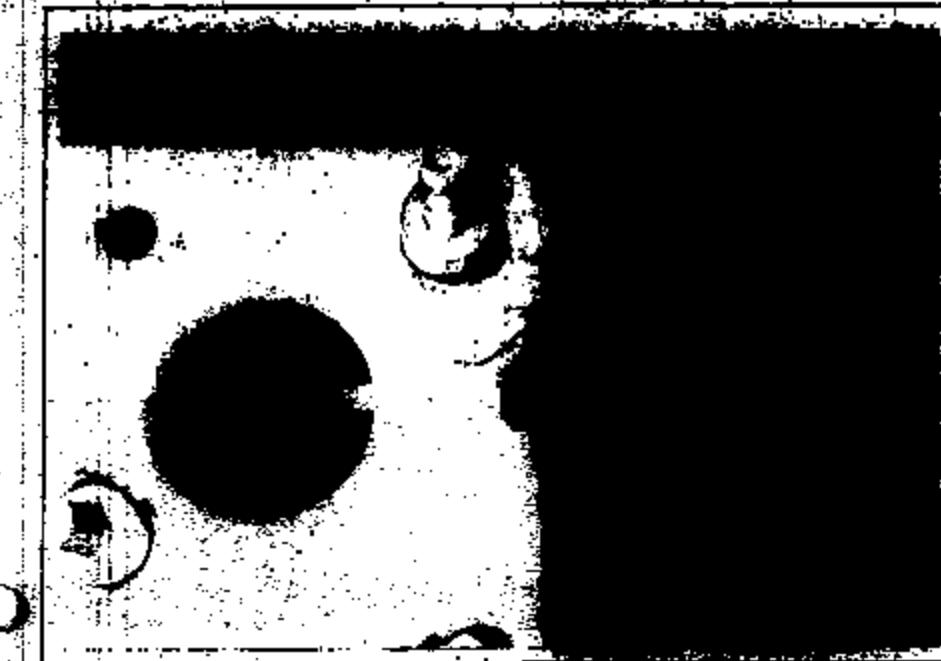
- (1) Improvement to surface precision of cowl attachment; end June onwards
- (2) Increase in thickness of bracket base sheet metal (1.2 > 1.46); end June onwards
- (3) Change shape of support: July onwards

End

Attachment 6-14

④ T100 73.4ヘカル BKT 頭部 No2

強力15kg



④ 30回

BKT-イシル味不叶 なし

④ 当該部 100回で
爆発發生。



④ 30回



④ 30回

本体の頭部、脚部
爆発發生

<1>
T100 77.4/09 BKT 耐久 No2

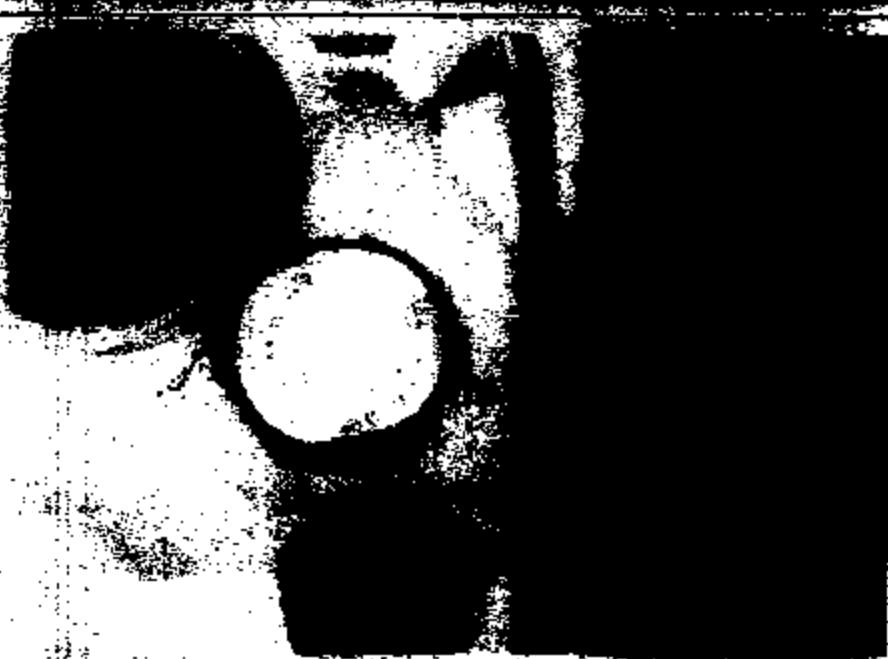
踏力 15kg

P2



200万回

BKT-12.0R20 100-185km/h



↑



↑

<2>
爪の頭に擦れ
発現



<3> 爪2番 17
発現

<1>

T100 79-チペラルBKT面M2 N02 路面15°

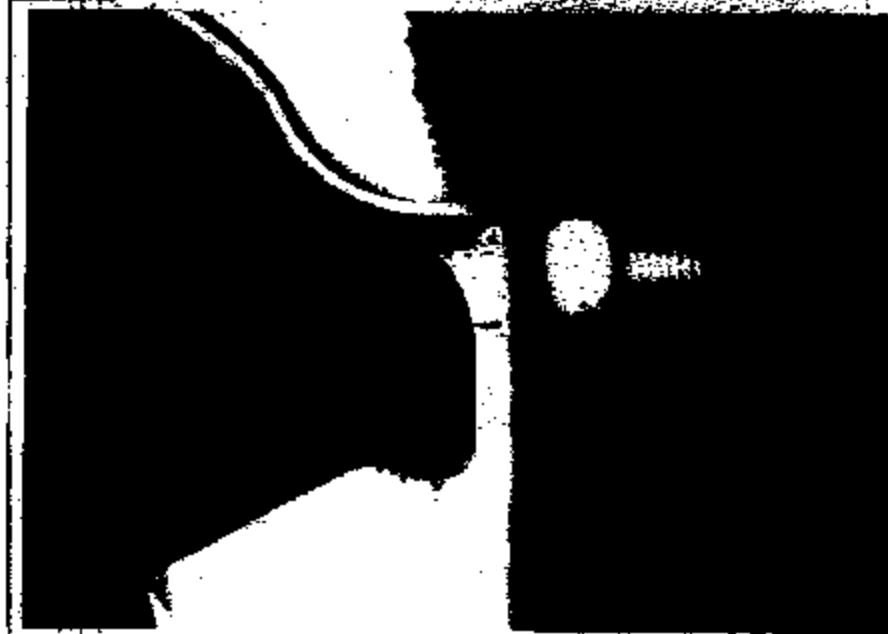


<2> 30回目

BKT-12ノット付近に

<3> 40回目

(105回目は垂直化)



30回

<4> 40回目

(105回目は垂直化)

41

T100 75L 全人字型 BKT 車輪 12.00-20 100/120-20 25kg

P4



42

317926回



317926回



317926回

T100 75.4/6311 BKT 頭12 小3

→130mm

→75kgf

P5



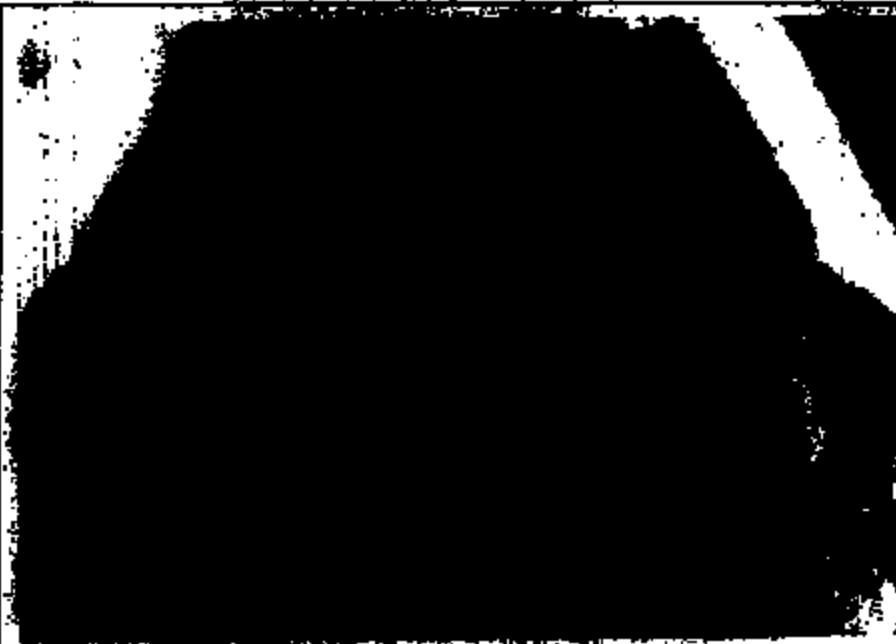
17920回

③ No.5 亀裂
(1mm)



④ No.18 亀裂
(15mm)

P8
T100 75.4 ハサウル BKT 耐久 No.3 A 鋼線輪→130kgfcm 1輪 25kg



(2) 317945回
ゲ-シNo.5 錆裂



317946回
ゲ-シNo.18 錆裂
(22mm)



317926回
ゲ-シNo.18 錆裂

(page 1)

- <1> T100 Clutch pedal bracket durability no. 2 / Force on pedal 15kgf
- <2> 300,000 times used
- <3> No bracket instrument panel bolt
- <4> This part experienced cracking after 100,000 times used.

(page 2)

- <1> T100 Clutch pedal bracket durability no. 2 / Force on pedal 15kgf
- <2> Cracking around the bolt head
- <3> Location where cracking occurs is weld no. 2.

(page 3)

- <1> T100 Clutch pedal bracket durability no. 3 / Force on pedal 15kgf
- <2> 300,000 times used
- <3> No bracket instrument panel bolt
- <4> Cracking
- <5> Outer side
No cracking after 100,000 times used
- <6> Inner side
No cracking after 100,000 times used

(page 4)

- <1> T100 Clutch pedal bracket durability no. 3 / Force on pedal 15kgf
- <2> 317,920 times used

(page 5)

- <1> T100 Clutch pedal bracket durability no. 3 / Force on pedal 15kgf
- <2> 17,920 times used
- <3> Gage no. 18 cracked (1mm)
- <4> Gage no. 18 cracked (15mm)

(page 6)

- <1> T100 Clutch pedal bracket durability no. 3 / Force on pedal 15kgf
- <2> 317,920 times used
- <3> Gage no. 5 cracked
- <4> Gage no. 18 cracked (22mm)

~~Attachment 6-12~~

1100 ペダルプラケット亀裂 (角) (スケール)

大 ○
中 ○
小 △

④ 原因別の影響度……

⑤ ×：亀裂の程度を表現

⑥ 1) 亀裂パターンでの層別と原因 ~イメージ~

⑦ 亀裂パターン

⑧

⑨ パターン②

⑩ 結論

⑪ 亀裂パターン					⑫ 不具合部位	⑬ C/L0SW.BKT.	⑭ 方ウルの ボルト弛み	⑮ 踏力 大
⑯	⑰ A	⑱ B	⑲ C	⑳ D	⑴ ベース ⑵ サポート ⑶ サポート ボルト部 ⑷ ベース ボルト部	⑵ ペダルストッパー	⑶	⑷
⑪ パターン①	⑰ A → ⑱ B	××	AのX 三次不具合	××	×	○	(○)	○
⑪ パターン②	⑰ A ≤ ⑱ B	×	××	×	×	○	○	

⑪ ⑫ の違いは、C/L. のスイッチBKT. とペダルストッパー当りの違い→こじり力違い

→方ウル取付部の弛み大小の違いによると推定。

C/L. ペダルプラケットの亀裂

42

1月号(2017年1月号) 全2回

43

亀裂のメカニズム

44

踏力
大

踏力
並
 \uparrow
C/L. BKT.
ストッパー

亀裂
パターン①
 α_1
(当り大)

亀裂
パターン②
 α_2
(当り中)

「こじり力」
発生

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ベースの
亀裂大
A 部

ペダル取付
ボルト際の
亀裂大
C 部

A
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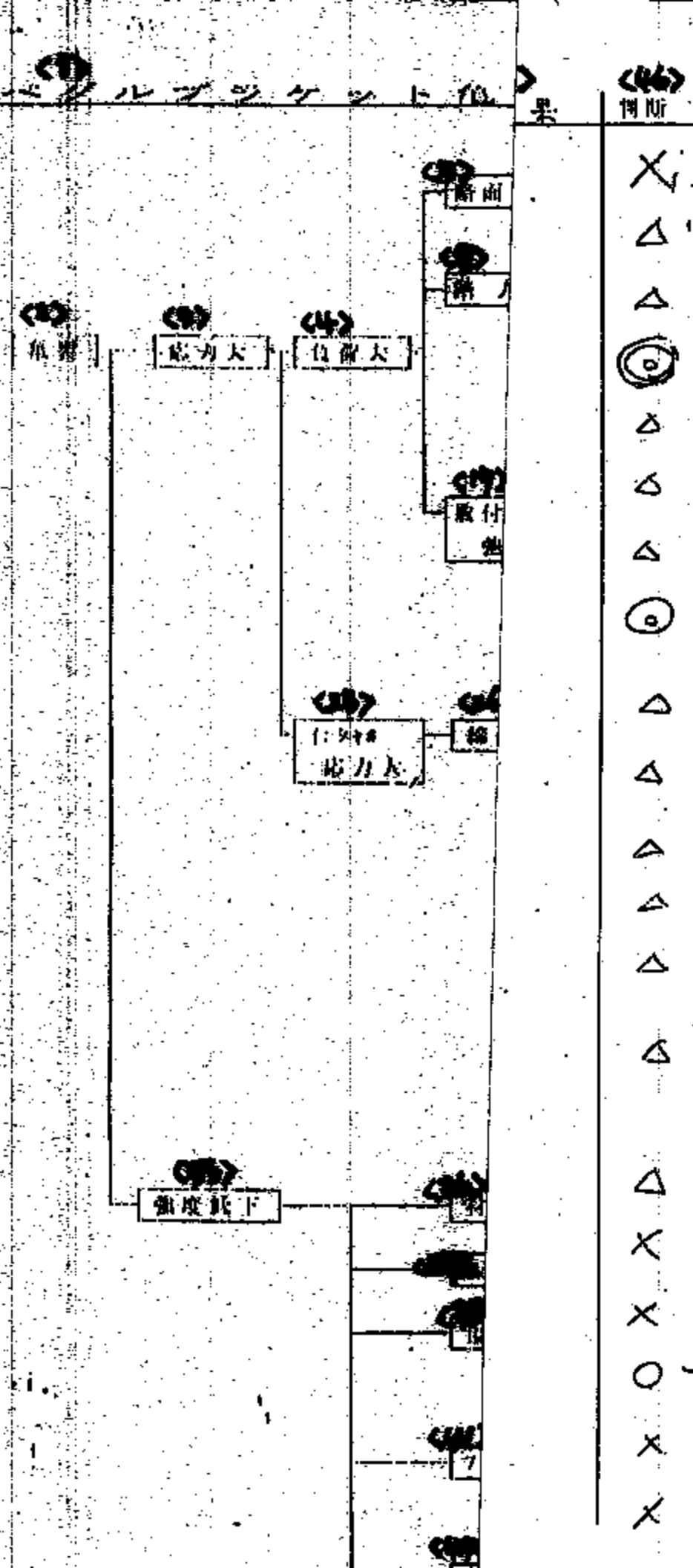
「こじり力」
発生

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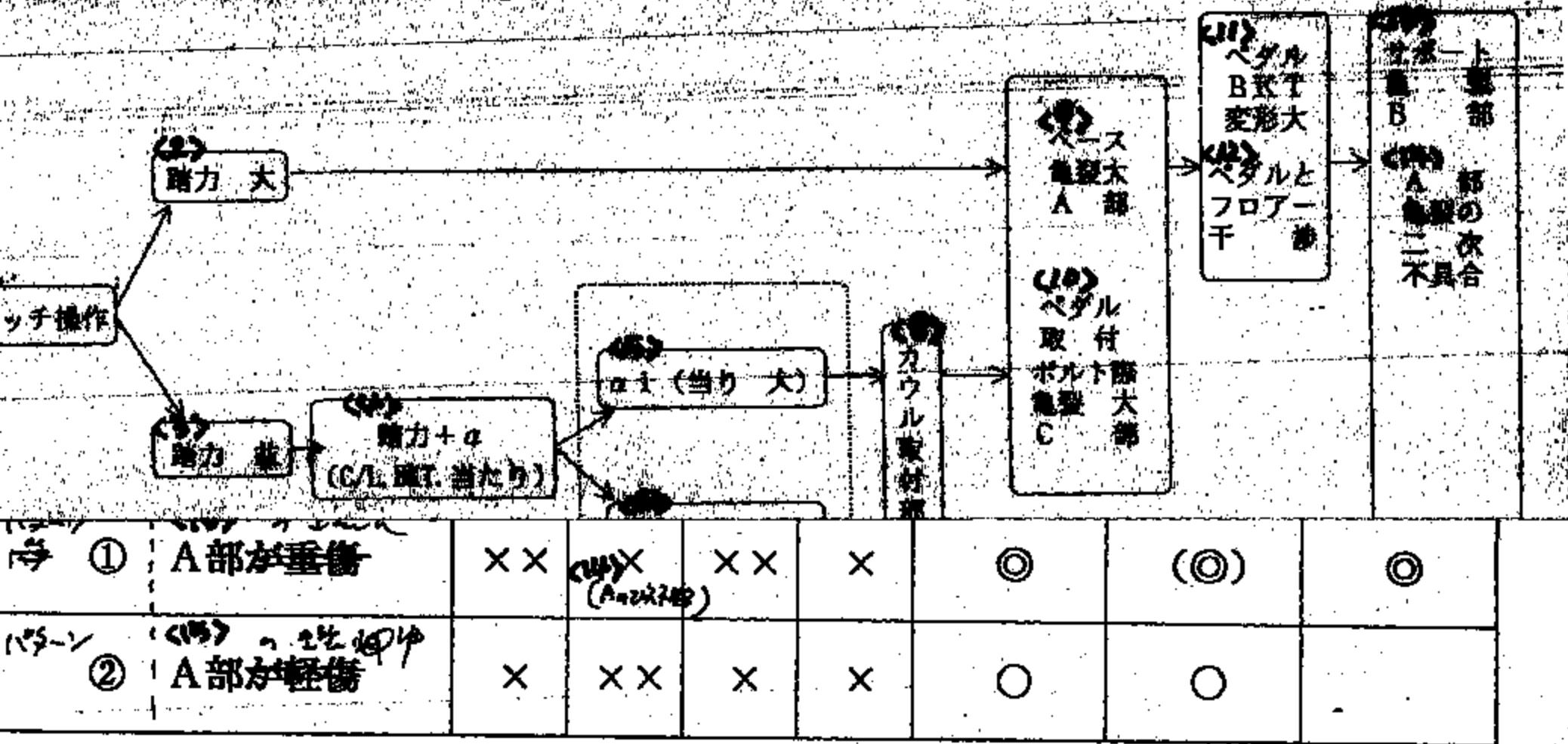
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(44)
 ○ 有
 △ 無
 X 有無不明

糊度紙下 Part



①②の違いは によると判断。

2kgf子300とペダルの2kgf子2kgf子の角度 → こじりかえ
→ からむ
→ ほぐす
→ ほぐす

Stage 1)

- > Test Pedal bracket cracking
- > Cause, movement
- > Level of load by cause
- > Strength:
 - Medium
 - Small
- > 1) Cracking pattern by layer and cause - image
- > Improvement of cracking
- > Cracking pattern:
 - Cause
 - Failed part
 - Base
- > Support:
 - Support hole edge
 - Bolt hole wall
- > Part of the clutch bracket is damaged
- > Gash bolt loosening
- > Relative force on pedal
- > Cracking pattern
- > Pattern 1
- > Glareless surface treatment, or Boring

Stage 2)

- > Cracking mechanism
- > Clutch operation
- > Large force on pedal
- > Normal force on pedal
- > Friction coefficient = 0
- > Clutch bracket stopper
- > Cracking pattern 1

Stage 3)

- c. 1 (large hit)
- <7> Cracking pattern 2
- a. 2 (medium hit)
 - <8> Difference in rotational resistance occurs
 - <9> Cowl attachment looseness
- <10> Significant
- <11> Medium
- <12> Pedal bracket deformation
- <13> Significant cracks to base (A part)
- <14> Significant cracks to pedal attachment bolt edge (C part)
- <15> Growth of cracked area in A part
- <16> Significant deformation of pedal bracket
- <17> Pedal and floor interference
- <18> Support cracks (B part)
- <19> A part cracks leading to secondary failure
- <20> Support cracks on left side of B part
- <21> Cracks separately.
- <22> Base cracks (A part)
- <23> Bolt edge cracks

(page 3)

- <1> Inferred mechanism for pedal bracket cracking
 - <2> Cracking
 - <3> Large stress
 - <4> Significant load
 - <5> Significant road surface input
 - <6> Significant body vibration
 - <7> Significant bracket movement
 - <8> Significant force on pedal
 - <9> Pedal factor
- <10> Clutch cylinder: significant reactive force
- <11> Clutch abrasion
- <12> Inadequate pedal play
- <13> Clutch out failure
- <14> Maintenance failure
- <15> Clutch reactive force

- <16> Force on pedal by driver
- <17> Looseness / shaking of attachment
- <18> Bolt tightening failure
- <19> Looseness
- <20> Cowl bolt A
- <21> Dash
- <22> Failure to apply grease to tightening surfaces
- <23> Looseness caused by clutch operation or vibration
- <24> Forgotten
- <25> Initial stress significant
- <26> Tightening stress significant
- <27> Bracket precision failure
- <28> Bracket falls out of right angle
- <29> Pedal bolt hole shifts
- <30> Pedal bolt over-tightened
- <31> Pedal bolt not tightened sufficiently
- <32> Attachment hole shifts
- <33> Assembly sequence
- <34> Dash x-base levelness
- <35> Reduction in strength
- <36> Materials failure
- <37> Sheet metal thickness failure
- <38> Damage
- <39> Press damage
- <40> Tightening damage
- <41> Bracket shape failure
- <42> Corvaer R.
- <43> Flange width
- <44> Spot position
- <45> Result
- <46> judge
- <47> Cause
- <48> Requires adjustment

(page 4)

<1> Clutch operation

<2> Significant shear on pedal

<3> Normal force on pedal

<4> Force on pedal + o On to clutch bracket

<5> o 1 (large hit)

<6> n = 2 (medium hit)

<7> Difference in rotational resistance occurs

<8> Clutch attachment becomes

<9> Significant shear cracking (A part)

<10> Significant bolt edge cracking on pedal attachment (C part)

<11> Pedal bracket deformation significant

<12> Pedal / floor interference

<13> Support cracking (B part)

* 14. Secondary failure of A part cracking

<1> T100 Pedal bracket cracked / damaged part

<2> Layering not caused by cracking pattern - image

<3> Level effect by cause

<4> Significant

Medium

Small

* 15. Clutch system

<1> Causes

<2> Failed part

<3>

<4> Clutch belt loosening

<5> Significant shear on pedal

<6> Cracking pattern

<7> Pattern 1

<8> A part: significant cracking

<9> A part secondary failure

<10> A part: small / medium level cracking

<11> The difference between (1) and (2) above is assumed to be due to the following:

difference between the clutch switch bracket and the pedal stopper assembly >

difference in rotational resistance > difference in level to which oval attachment becomes loose.

~~Annex 6-16~~

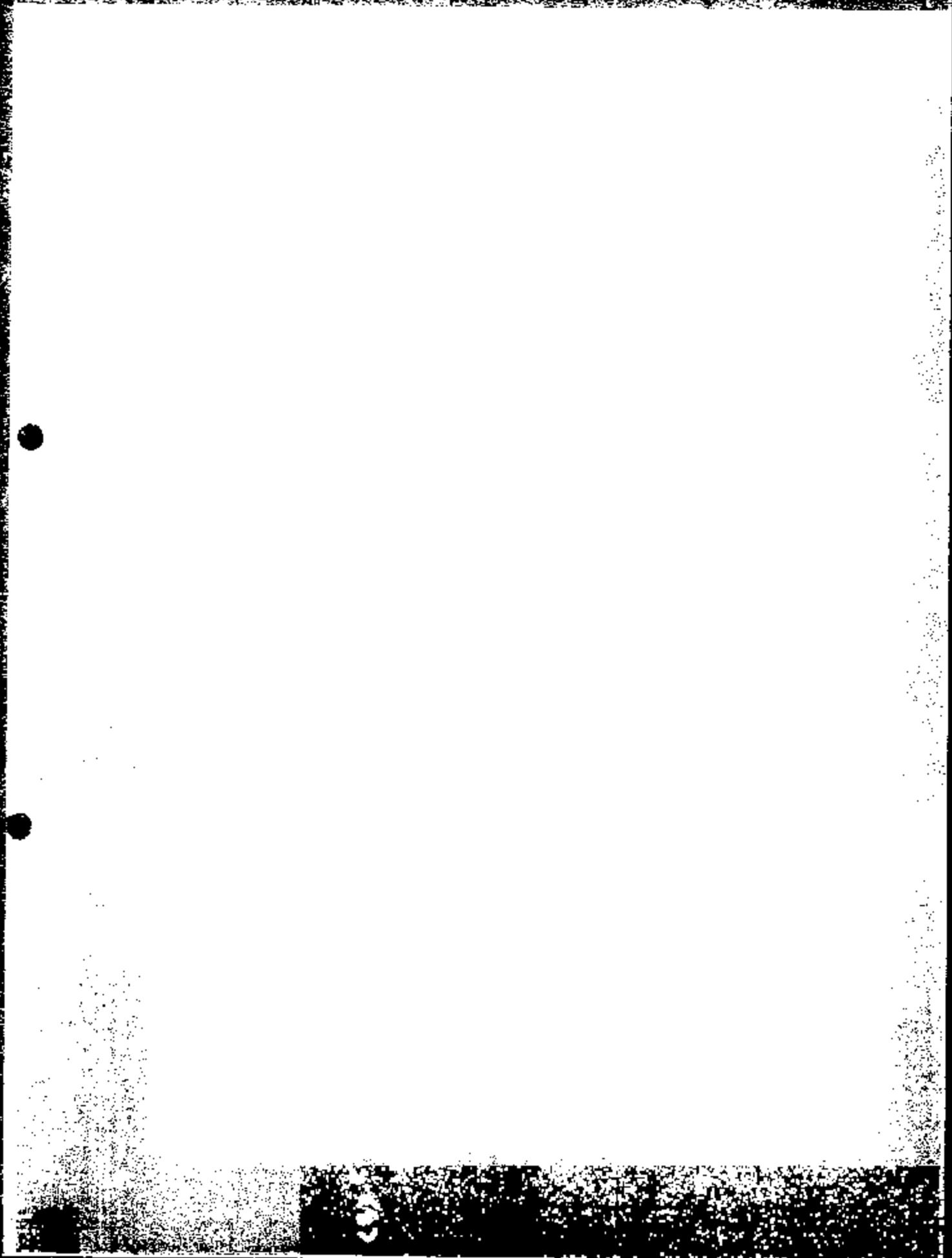
CD
音楽ソフト

品番	品名	主な販路別				主な販路別		
		小売店	書店	音楽専門店	通信販売	小売店	書店	音楽専門店
65181 製品								
65181製品								
音楽専門A	37.5	56.5	14.0	16.0	32.1	21.0	10	10.1
音楽専門B	24.3	23.7	10.0	20	34.5	34	48.5	29.3
音楽専門C	37.3	65	56.7	57.1	61.5	64.5	54	54
65182 製品								
65182製品								
音楽専門A	24.2	21.4	50.0	4.24	34.4	32.0	22.4	17.3
音楽専門B	46.2	36.9	29.0	28.0	22.1	2.40	6.85	2.30
音楽専門C	40	38.1			22.7	20.0		
音楽専門D	25.4	21.2			31.3	31		
音楽専門E	37.1	65.0			52.5	61.4		
65183 製品								
65183製品								
音楽専門C	34.5	29.3			29.7	53		
音楽専門E	46.3	36.4			22.0	2.20		

(page 1)

- <1> Results of analysis of T100 clutch bracket
- <2> Part condition
 - <3> Location cracking occurred
 - <4> Max. value of main stress
 - <5> Surface
 - <6> Cracked market part
 - <7> Countermeasure proposal 1+ change support
 - <8> Countermeasure proposal 2
 - <9> Countermeasure proposal 3 (45 degree)
- <10> Underside
- <11> Bolt tightening condition
- <12> 66181-part
- <13> Cracked part A
- <14> Bolt loosening condition
- <15> Basis : increased (1.2 → 1.44)

Attachment 6-17



P2

44 hours

(page 1)

- <--> Analysis of T100 clutch pedal bending strength (with bolts tightened sequentially)
 - <--> Analysis initial condition
 - <--> Stress contours completely re-evaluated
 - <--> Bolt stress after fully tightened
 - <--> Load re-distribution
- <--> Analysis initial deformation diagram (scale 1:1)
- <--> Active deformation
 - <--> Deformation

(page 2)

- <--> Analysis of T100 clutch pedal bending strength (with bolts tightened sequentially)
 - <--> Analysis initial deformation diagram (scale 10:1)
 - <--> View from front
 - <--> View from side
 - <--> View from above

(page 3)

- <--> Analysis of T100 clutch pedal bending strength (with bolts tightened sequentially)
 - <--> Deformation and stress distribution of 50160 parts
 - <--> Boundary
 - <--> Deformation

(page 4)

- <--> Analysis of T100 clutch pedal bending strength (with bolts tightened sequentially)
 - <--> Deformation and stress distribution of 50160 parts
 - <--> Boundary
 - <--> Deformation

(page 5)

- <--> Analysis of T100 clutch pedal bending strength (with bolts tightened sequentially)
 - <--> Deformation and stress distribution of 50160 parts
 - <--> Boundary
 - <--> Deformation

Attachment 6-18

P1

462

P2

(page 1)

- <1> Analysis of T100 clutch pedal bracket strength (with bolts loosened)
- <2> External view of analysis model
- <3> Analysis model deformation diagram (scale 1:1)
- <4> Sheet exterior completely restrained
- <5> Bolt fixing part unrestrained
- <6> Bolt fixing part fully restrained
- <7> Load 14.8kgf
- <8> After deformation
- <9> Before deformation

(page 2)

- <1> Analysis of T100 clutch pedal bracket strength (with bolts loosened)
- <2> Deformation and stress distribution of 55183 parts
- <3> Surface
- <4> Underside

(page 3)

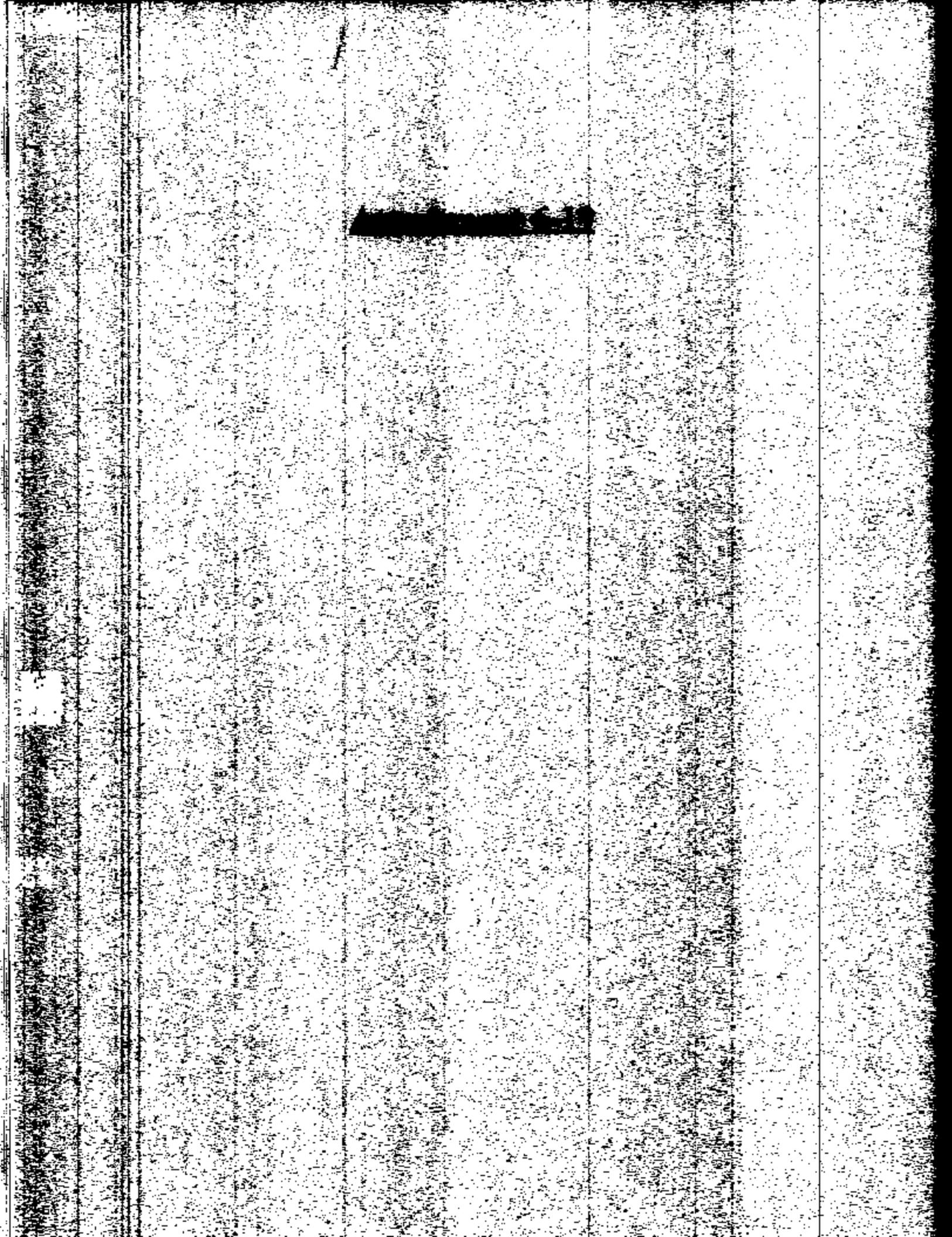
- <1> Analysis of T100 clutch pedal bracket strength (with bolts loosened)
- <2> Deformation and stress distribution of 55183 parts
- <3> Surface
- <4> Underside

(page 4)

- <1> Analysis of T100 clutch pedal bracket strength (with bolts loosened)
- <2> Analysis model deformation diagram (scale 10:1)
- <3> View from front
- <4> View from side
- <5> View from above

(page 5)

- <1> Analysis of T100 clutch pedal bracket strength (with bolts loosened)
- <2> Deformation and stress distribution of 55183 parts
- <3> Surface
- <4> Underside



P4

Q2 1002

57

(page 1)

- > Analysis of T100 clutch pedal bracket strength.
- > Countermeasure proposal 1 (55181 parts t=1.6, with bolts tightened normally)
- > External view of analysis model
- > Base under completely restrained
- > Bolt fixing part fully restrained
- > Load: 14.5kNf
- > After deformation
- > Before deformation

(page 2)

- > Analysis of T100 clutch pedal bracket strength.
- > Countermeasure proposal 2 (55181 parts t=1.6, with bolts tightened normally)
- > Analysis load & deformation diagram (scale 10x)
- > View from front
- > View from side
- > View from above

(page 3)

- > Analysis of T100 clutch pedal bracket strength.
- > Countermeasure proposal 3 (55181 parts t=1.6, with bolts tightened normally)
- > Deformation and stress distribution of 55181 parts
- > Section
- > Uncertainty

(page 4)

- > Analysis of T100 clutch pedal bracket strength.
- > Countermeasure proposal 3 (55181 parts t=1.6, with bolts tightened normally)
- > Deformation and stress distribution of 55183 parts
- > Section
- > Uncertainty

(page 5)

- > Analysis of T100 clutch pedal bracket strength.
- > Countermeasure proposal 3 (55181 parts t=1.6, with bolts tightened normally)
- > Deformation and stress distribution of 55182 parts

Surface

Underside

~~Attachment 6-20~~

Choice

P4

1160

103

104

(Stage 1)

- » Analysis of T100 clutch pedal bending strength
 - ↳ Load direction 45° oblique
- » Combined contact parts (parts tightened normally)
- » Deformation view of analysis model
- » Sheet metal has completely屈服ed
- » Both bearings fully屈服ed
- » Load direction 45° oblique
- » Analysis model deformation diagram
- » After deformation
- » Contact deformation

(Stage 2)

- » Analysis of T100 clutch pedal bending strength
 - ↳ Load direction 45° oblique
- » Combined contact parts (parts tightened normally)
- » Analysis model deformation diagram (scale 10:1)
- » View front-left
- » View from side
- » View from above

(Stage 3)

- » Analysis of T100 clutch pedal bending strength
 - ↳ Load direction 45° oblique
- » Combined contact parts (parts tightened normally)
- » Deformation and stress distribution of 55155 parts
- » Surface
- » Underbody

(Stage 4)

- » Analysis of T100 clutch pedal bending strength
 - ↳ Load direction 45° oblique
- » Combined contact parts (parts tightened normally)
- » Deformation and stress distribution of 55155 parts
- » KIC function
- » Underbody

(page 5)

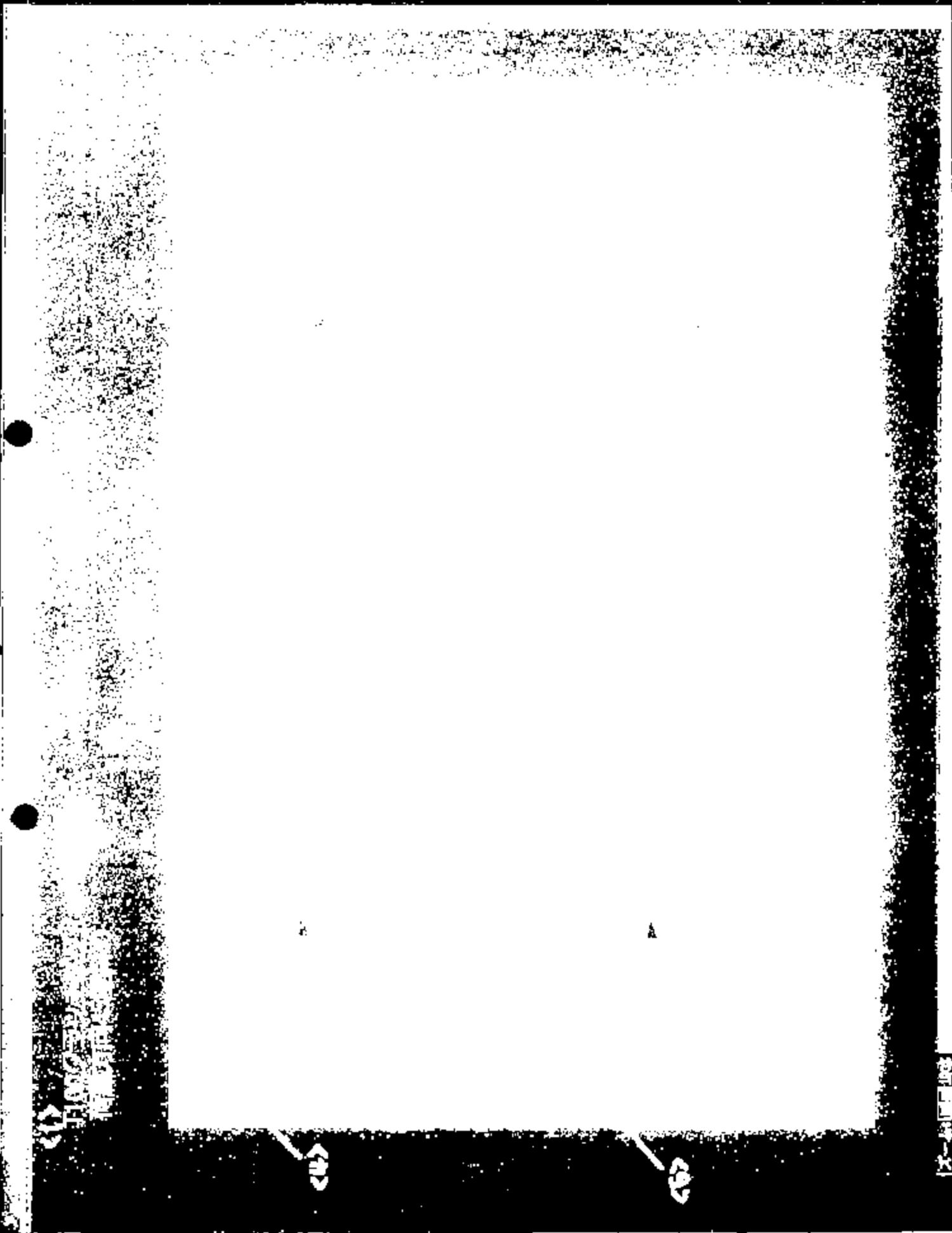
- <1> Analysis of T100 clutch pedal bracket strength
Load direction 45° oblique
- <2> Cracked market parts (bolts tightened normally)
- <3> Deformation and stress distribution of 55183 parts
- <4> Surface
- <5> Underside

~~Attachment 6-21~~

CC

T1002

44



P10

(page 1)

- <1> Analysis of T100 clutch pedal bracket strength
 - Load direction 45° oblique
- <2> Countermeasure proposal 2 (bolts tightened normally)
- <3> External view of analysis model
- <4> Sheet exterior completely restrained
- <5> Bolt fixing part fully restrained
- <6> Load 14.8kgf / 45° oblique
- <7> Analysis model deformation diagram (scale 1:1)
- <8> After deformation
- <9> Before deformation

(page 2)

- <1> Analysis of T100 clutch pedal bracket strength
 - Load direction 45° oblique
- <2> Countermeasure proposal 2 (bolts tightened normally)
- <3> Analysis model deformation diagram (scale 10:1)
- <4> View from front
- <5> View from side
- <6> View from above

(page 3)

- <1> Analysis of T100 clutch pedal bracket strength
 - Load direction 45° oblique
- <2> Countermeasure proposal 2 (bolts tightened normally)
- <3> Deformation and stress distribution of 55183 parts
 - <4> Surface
 - <5> Underside

(page 4)

- <1> Analysis of T100 clutch pedal bracket strength
 - Load direction 45° oblique
- <2> Countermeasure proposal 2 (bolts tightened normally)
- <3> Deformation and stress distribution of 55183 parts
 - <4> Surface
 - <5> Underside

page 5)

- <--> Analysis of T100 clutch pedal bracket strength
 - Load direction: 45° oblique
- <--> Countermeasure proposal 2 (holes tightened normally)
- <--> Deformation and stress distribution of 55183 parts
- <--> Surface
- <--> Uniformity

page 6)

- <--> Analysis of T100 clutch pedal bracket strength
- <--> Countermeasure proposal 2 (holes tightened normally)
- <--> Horizontal view of analysis model
- <--> Sheet material completely loosened
- <--> Hole 10mm part fully tightened
- <--> Load: 1.42kN
- <--> Analysis model deformation diagram (scale 1:1)
- <--> After deformation
- <--> Before deformation.

page 7)

- <--> Analysis of T100 clutch pedal bracket strength
- <--> Countermeasure proposal 2 (holes tightened normally)
- <--> Analysis model deformation diagram (scale 10:1)
- <--> View from front
- <--> View front side
- <--> View from above

page 8)

- <--> Analysis of T100 clutch pedal bracket strength
- <--> Countermeasure proposal 2 (holes tightened normally)
- <--> Deformation and stress distribution of 55183 parts
- <--> Surface
- <--> Uniformity

(page 8)

- <1> Analysis of T410 simple peeling impact strength
- <2> Crosscut surface protocol 2 (cutting direction normal)
 - <3> Deformation and strain calculation of 55186 parts
- <4> Surface
- <5> Undercut

(page 10)

- <1> Analysis of P100 simple peeling impact strength
- <2> Crosscut surface protocol 2 (cutting direction normal)
 - <3> Deformation and strain calculation of 55186 parts
- <4> Surface
- <5> Undercut

Attachment 6-22

《》T100 クラッシュペダルBKT応力分布(対策品)

機器名

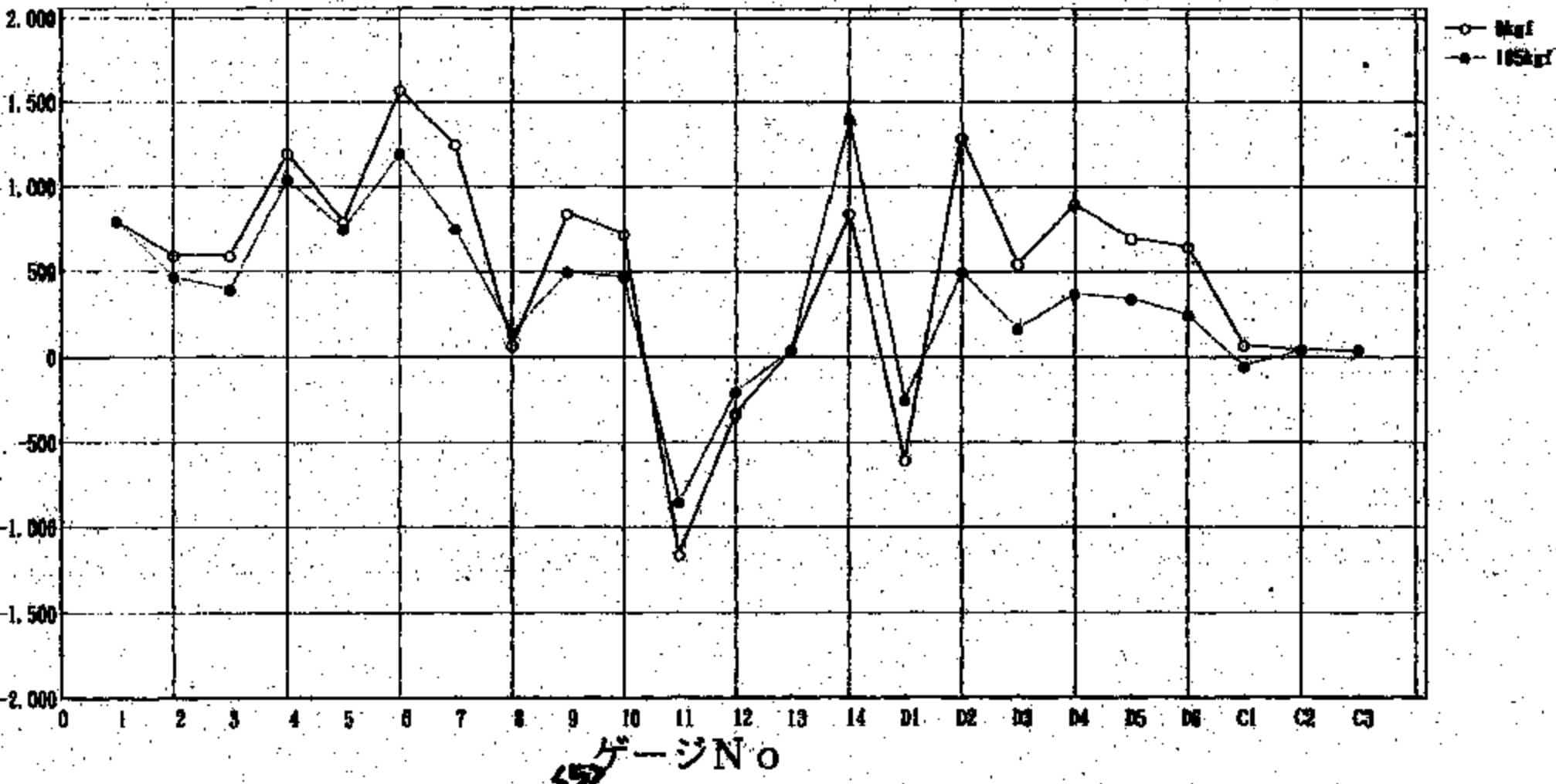
②

対策品(BKT, ダッシュ)・端力→15kgf+10kgf

単位: μ

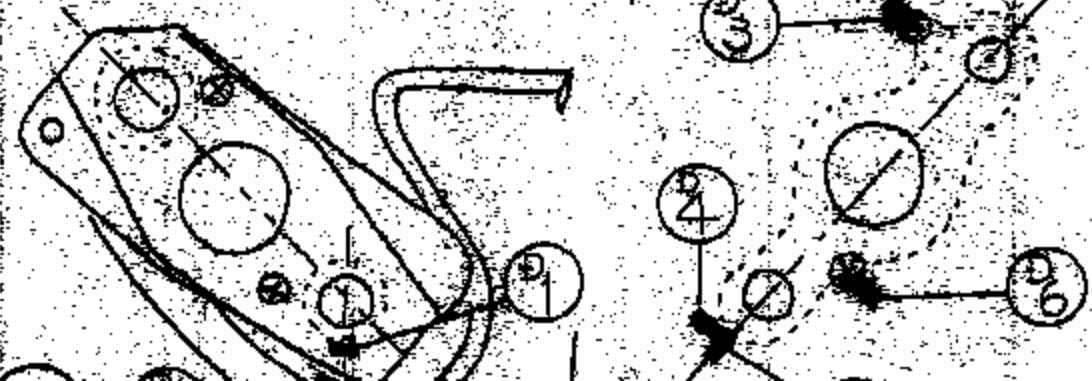
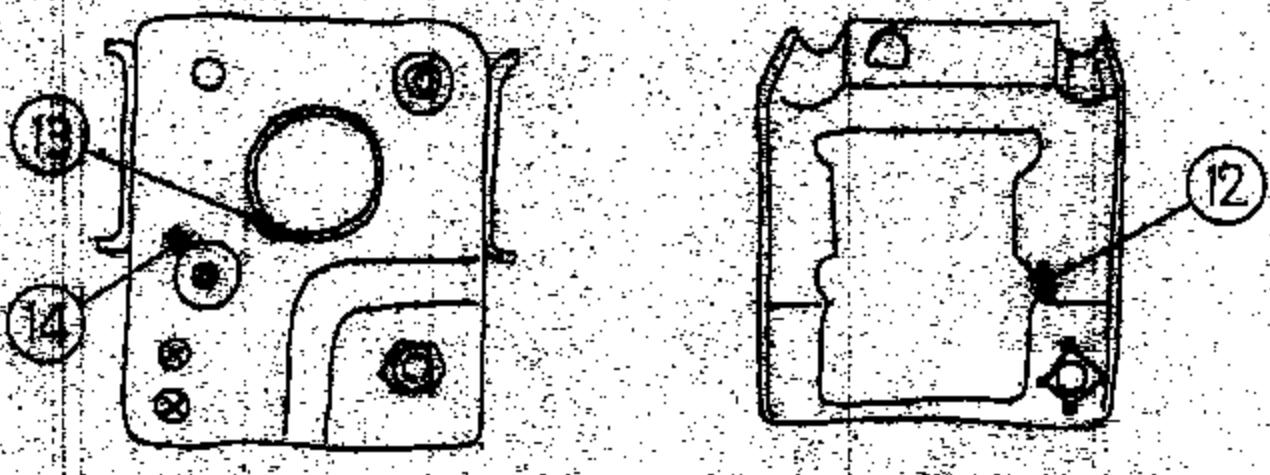
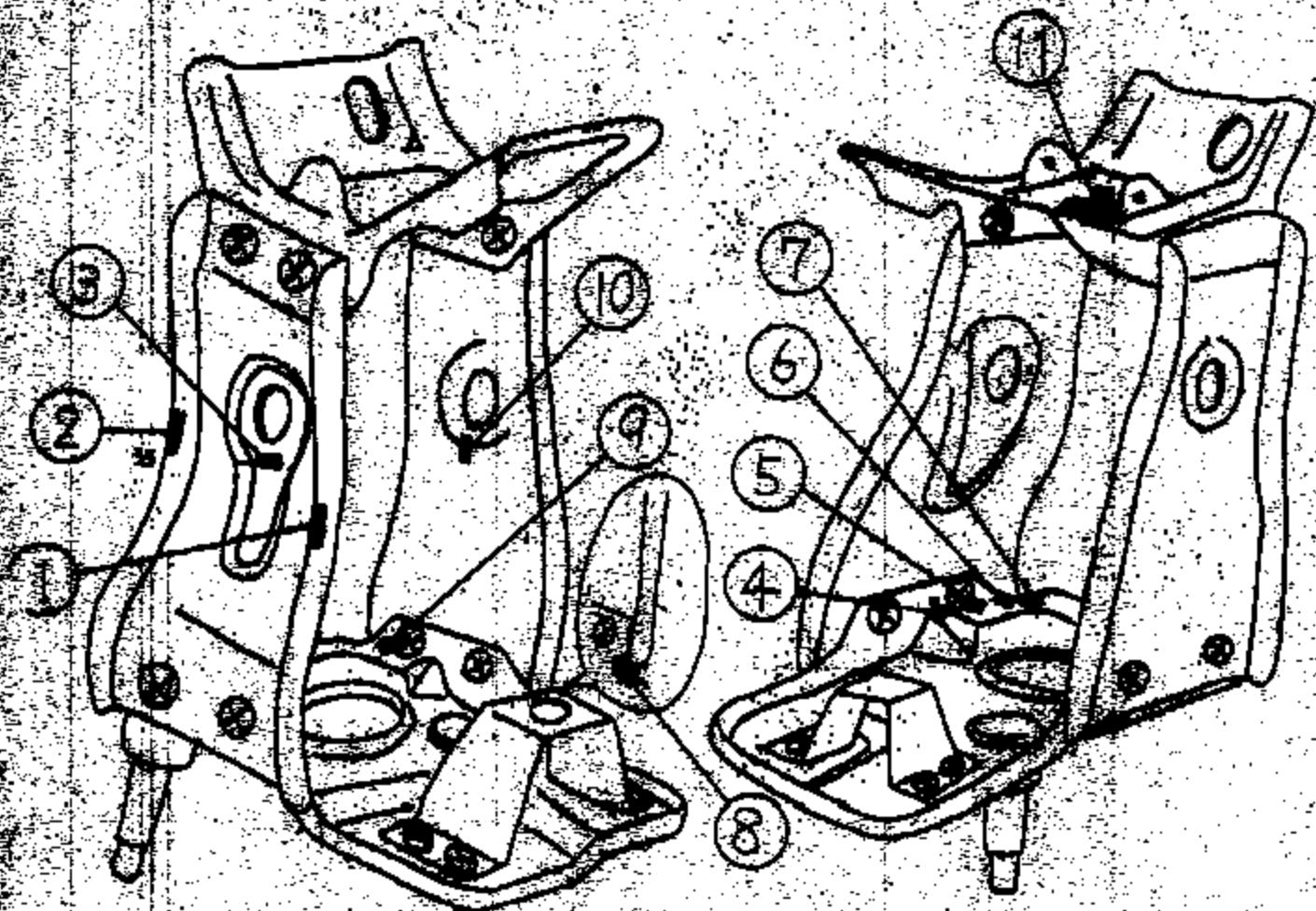
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Maxf	600	660	600	1,050	750	1,070	1,250	750	850	720	-1,150	-320	50	650
15kgf	800	475	400	1,050	750	1,200	750	150	500	475	-450	-200	50	1,400

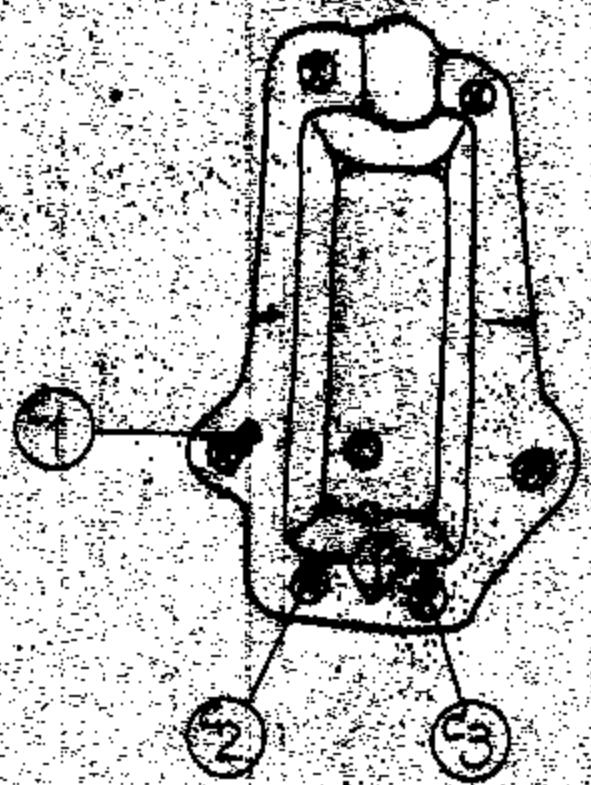
	D1	D2	D3	D4	D5	D6	C1	C2	C3	C4	C5	C6	C7	C8
Maxf	-300	1,300	550	900	700	550	15	50	50	50	50	50	50	50
15kgf	-250	500	175	375	250	200	50	50	50	50	50	50	50	50



11

70077-4 BKT (対応品) 応力測定





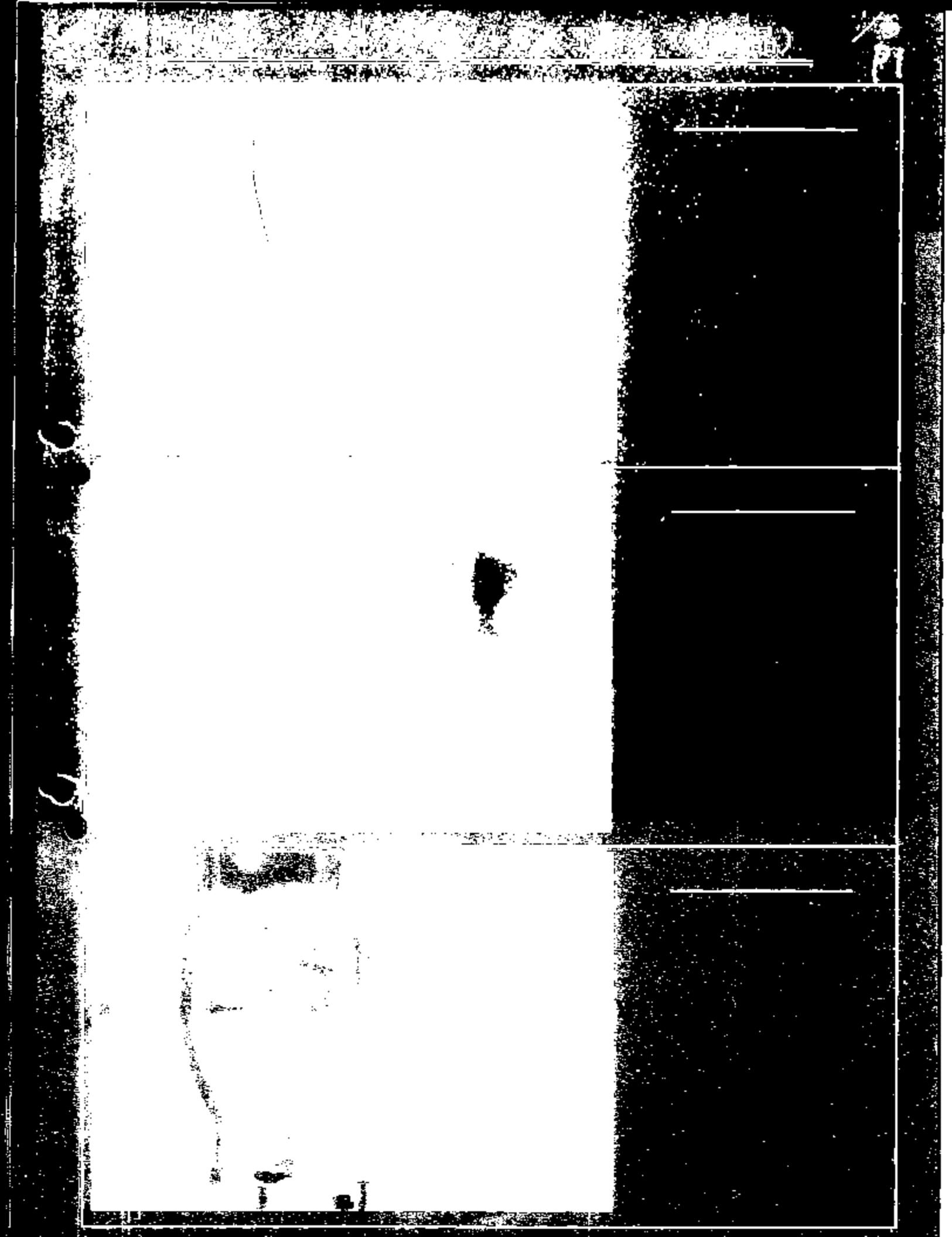
Setup 1:

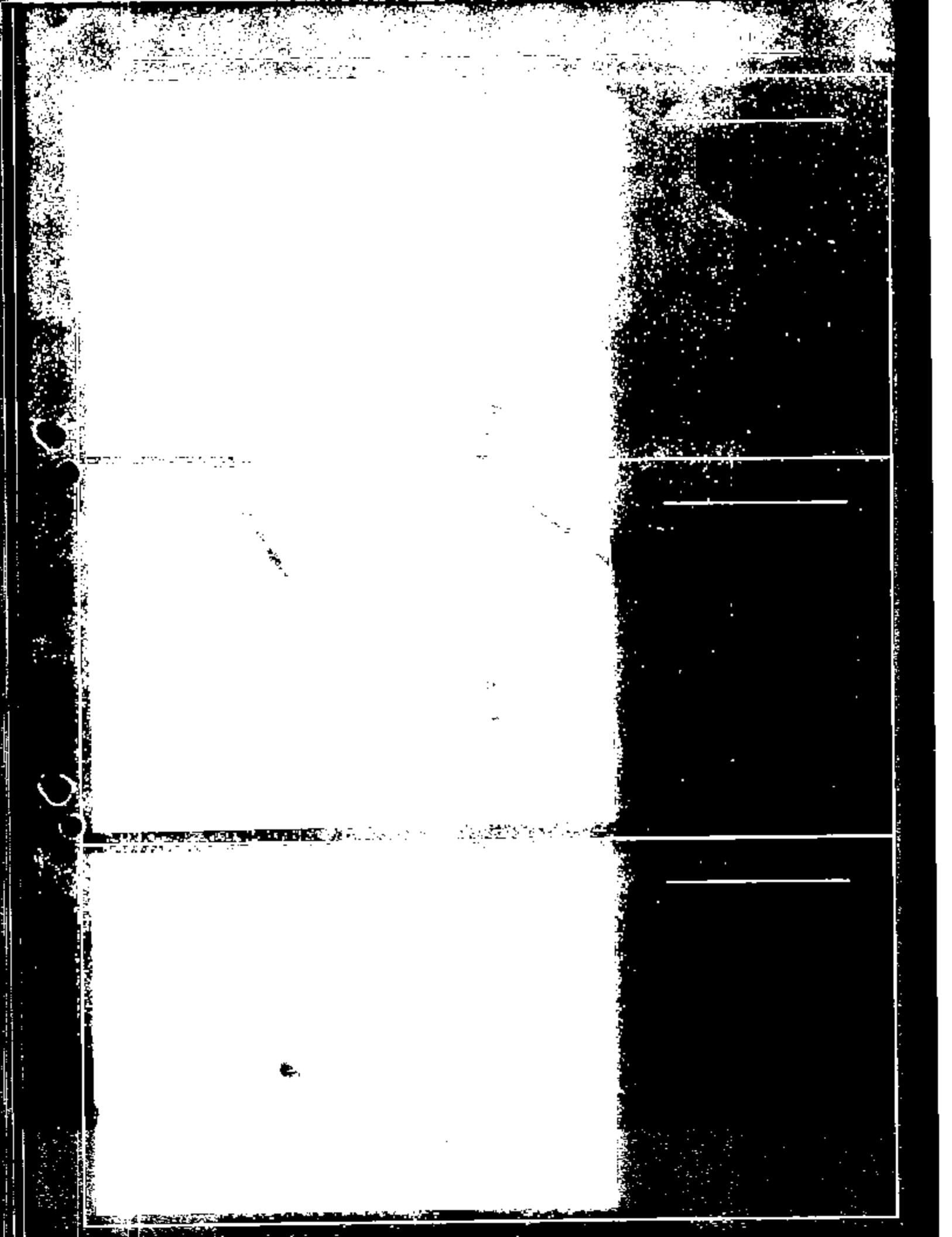
- > T100 Electro pedal bracket stress distribution measurement setup
- > Countermeasures part (bracket, wheel / force on pedal) > 10kg -> 10kg
- > Unit: μ
- > Distortion (μ)
- > Gauge No.

Setup 2:

- > T100 Clash bracket (countermeasures part) stress measurement

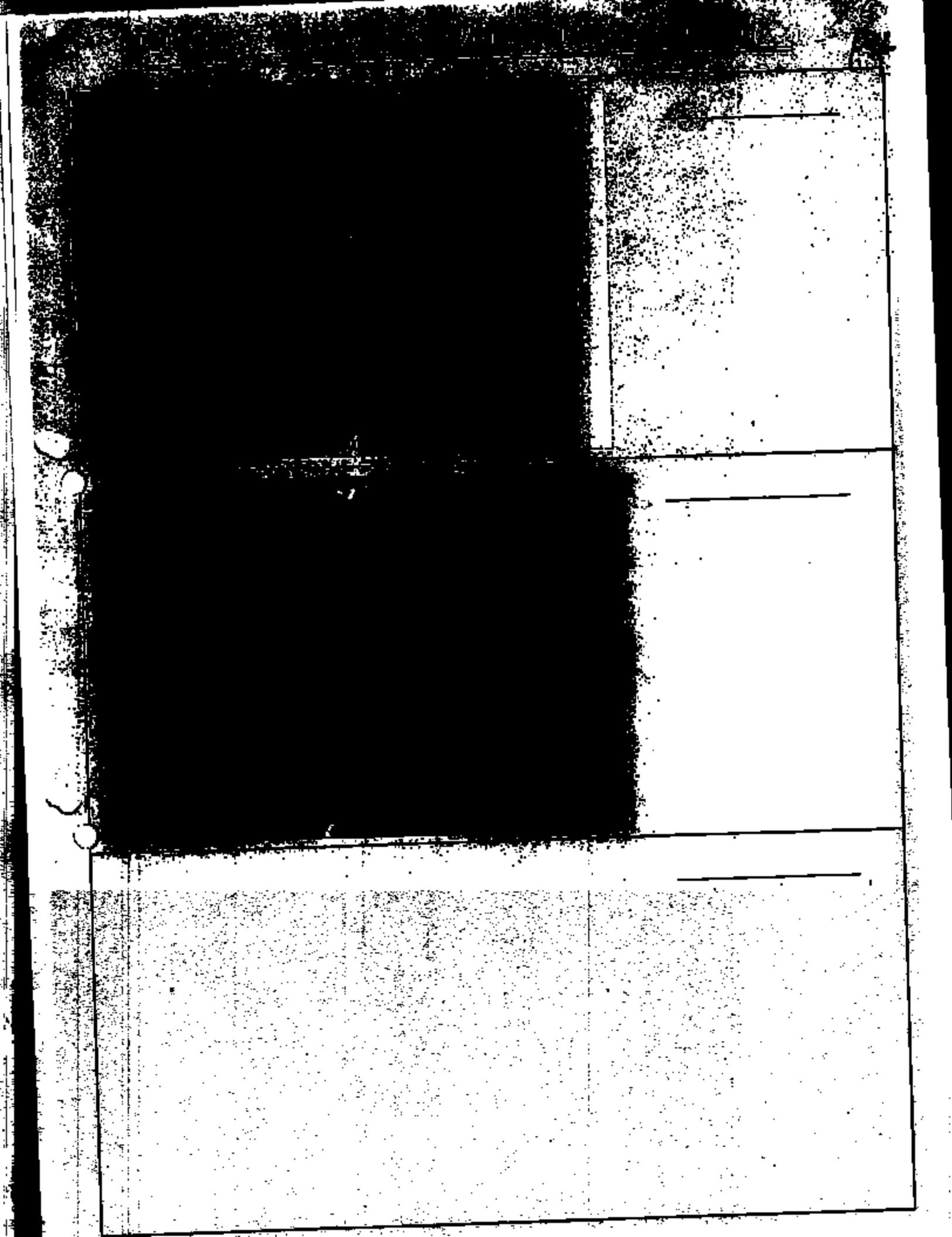
Attachment 6-23





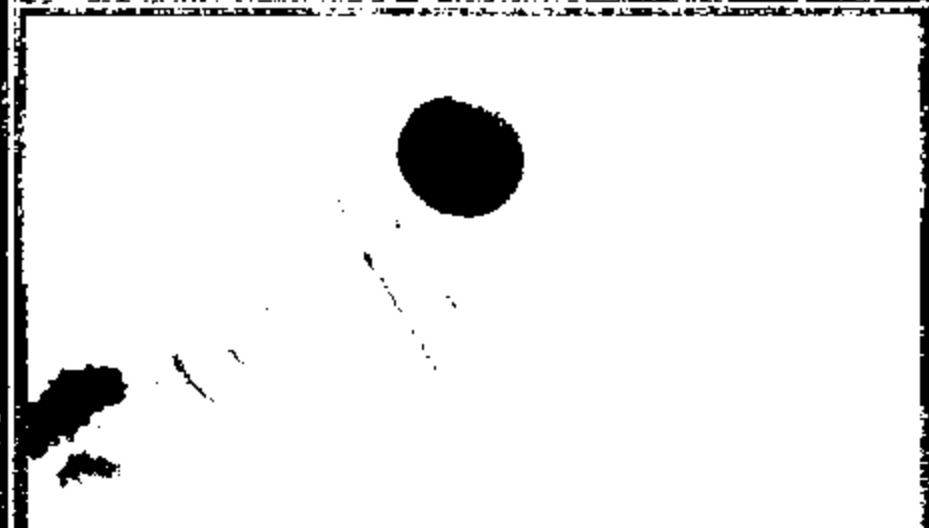
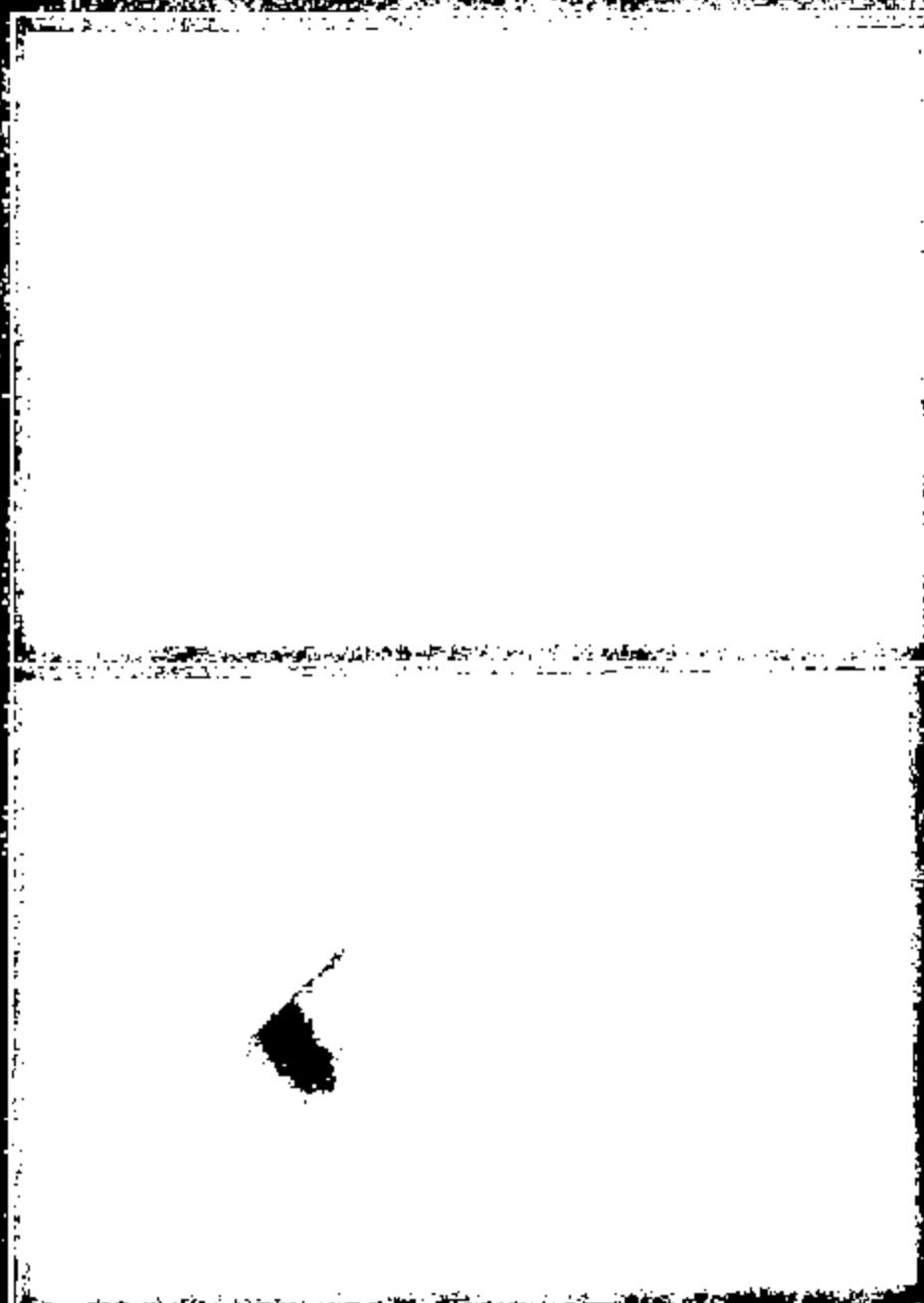
P3
5/6





P5
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T100 フラッシュ用BK印紙(新規品)



6/6
P6

(page 1)

T100 Clutch pedal bracket durability (countermeasure part)

(page 2)

T100 Clutch pedal bracket durability (countermeasure part)

(page 3)

T100 Clutch pedal bracket durability (countermeasure part)

(page 4)

T100 Clutch pedal bracket durability (countermeasure part)

(page 5)

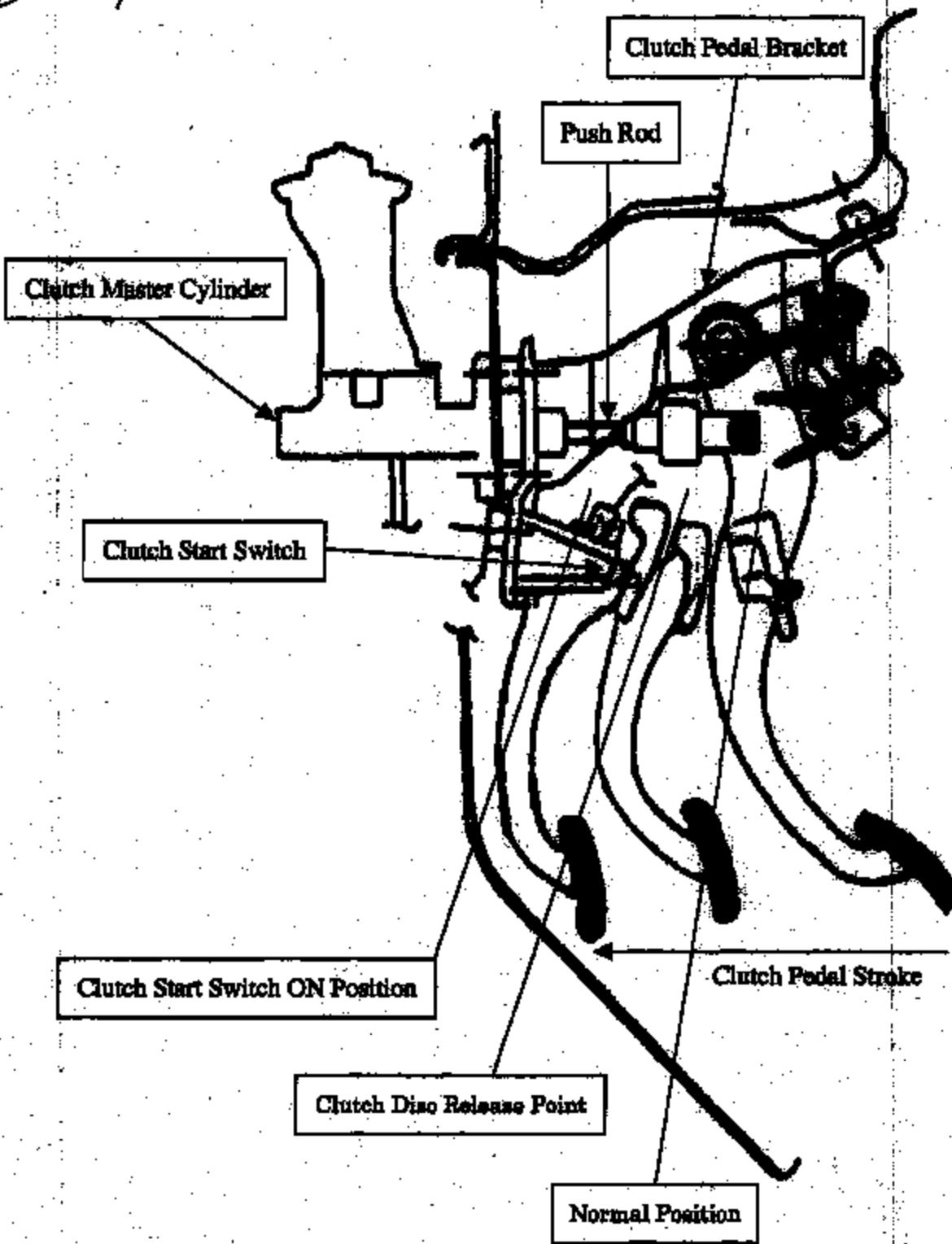
T100 Clutch pedal bracket durability (countermeasure part)

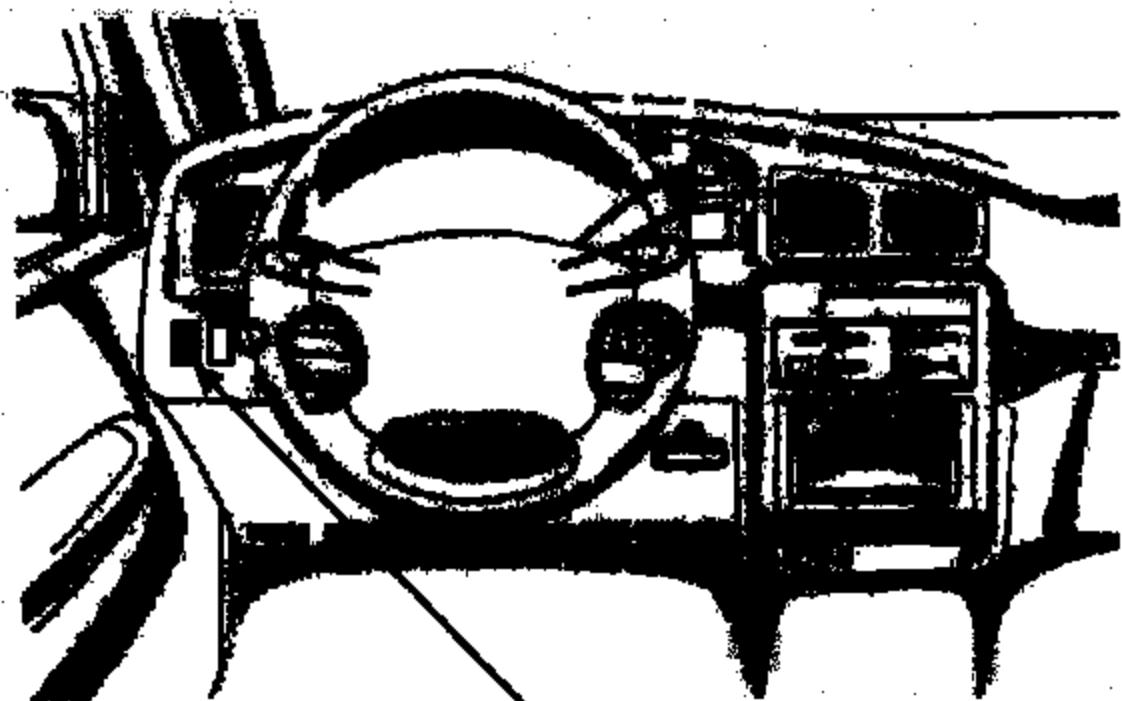
(page 6)

T100 Clutch pedal bracket durability (countermeasure part)

Toyota
PEO2039
6-24-02

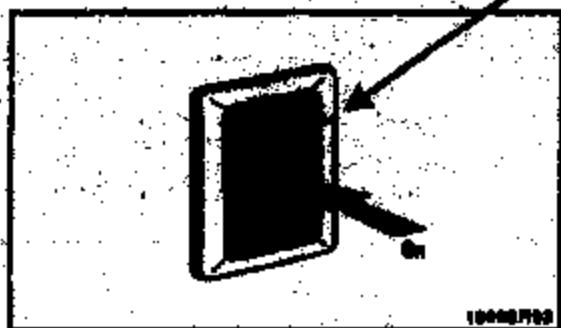
Attachment 7-1





Clutch start cancel switch

**Clutch start cancel switch
Four-wheel drive models
with manual transmission**



100-00000

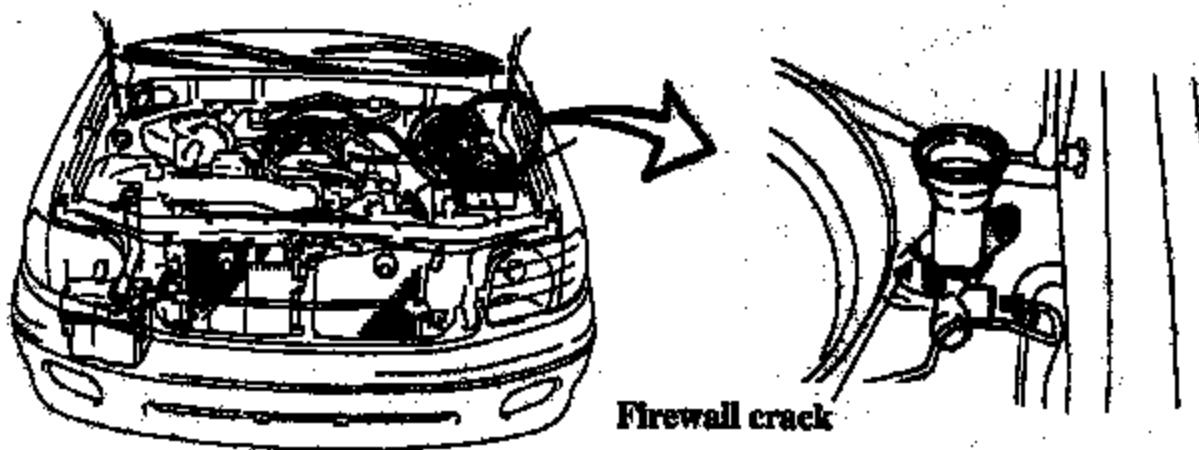
To crank the engine without depressing the clutch pedal, push the switch with the ignition on.

This switch stays on as long as the ignition is on. And it will automatically turn off when the ignition is off.

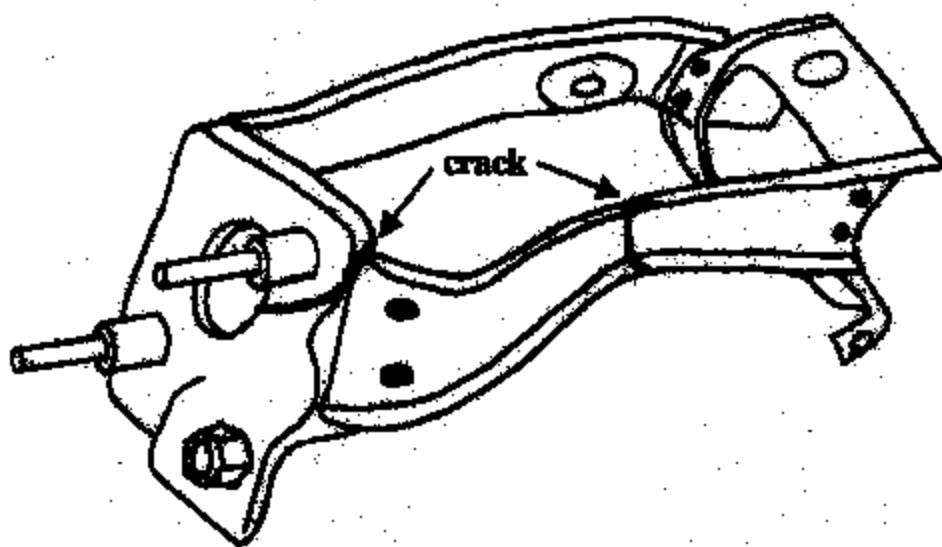
This switch cancels the clutch start system, which is designed to keep the starter motor from operating if the clutch pedal is not depressed all the way down.

This switch allows the vehicle to be driven out of difficult situations by cranking the engine with the clutch engaged.

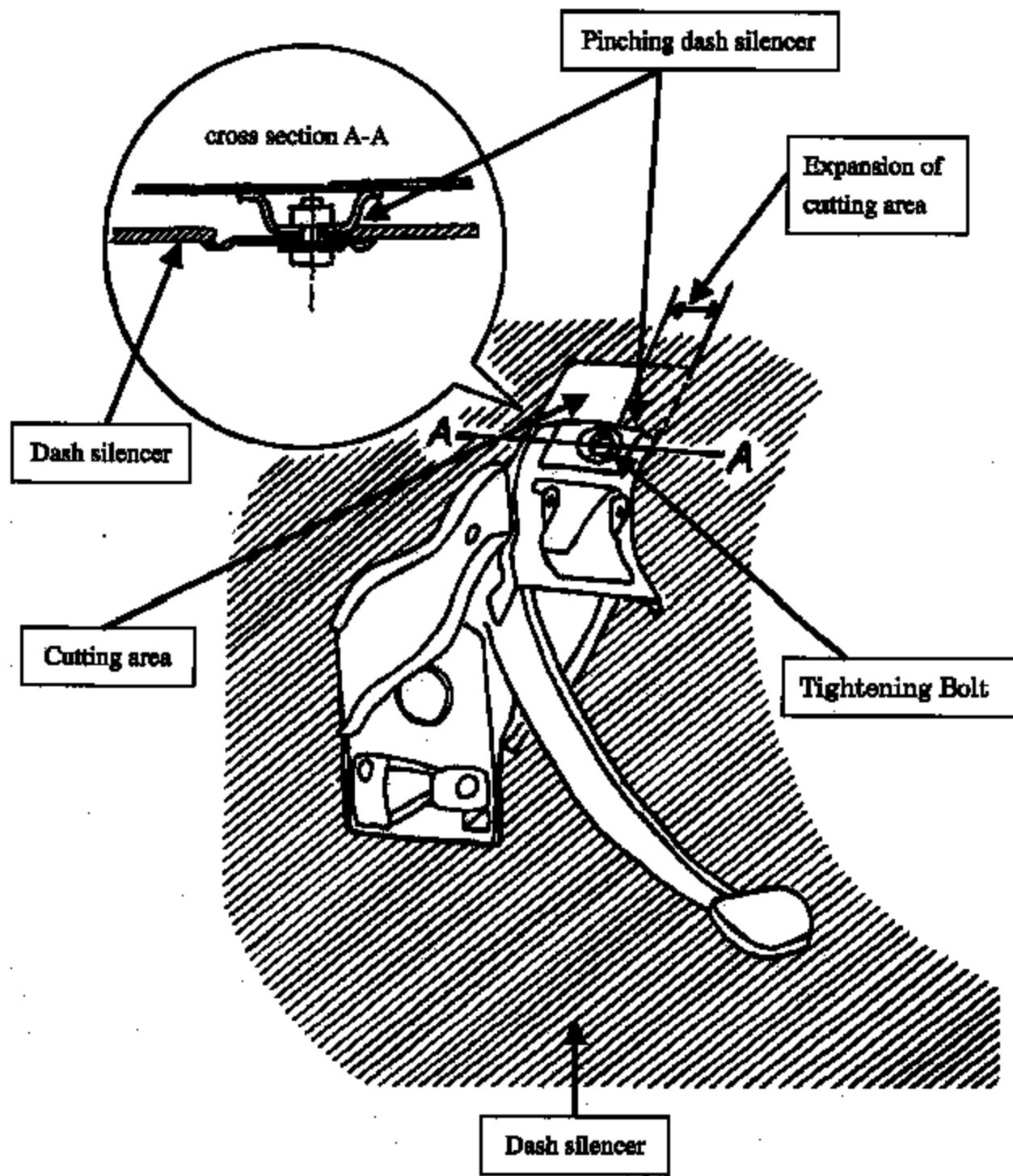
Never use the switch for normal engine starting. Be sure to follow the starting procedures instructed in "How to start the engine" in Part 8.

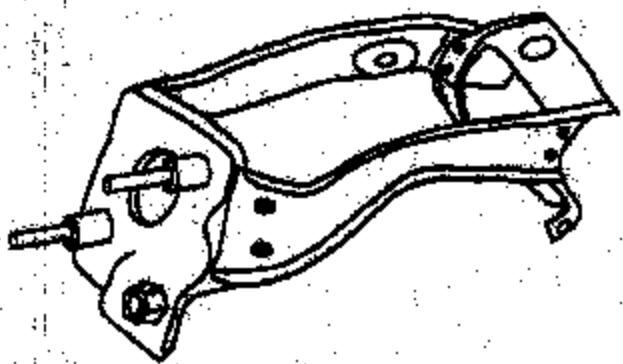


Crack in Firewall

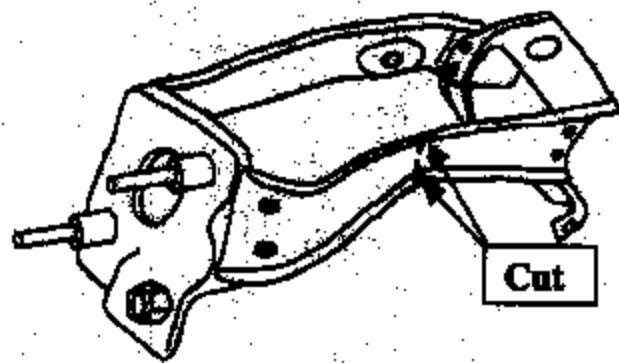


Crack in clutch pedal bracket

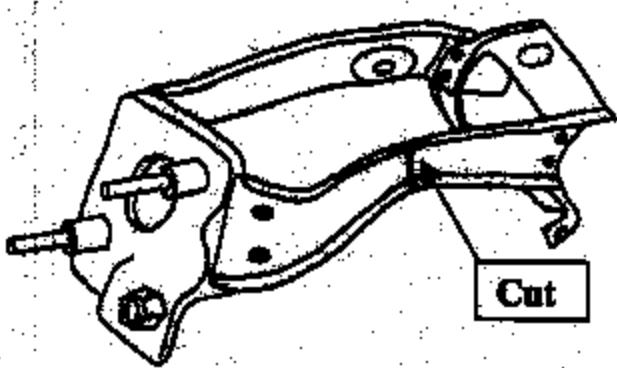




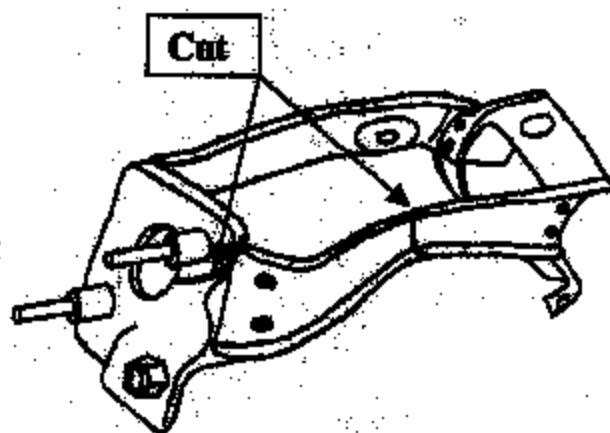
No Crack



Small Crack



Medium Crack



Large Crack

